











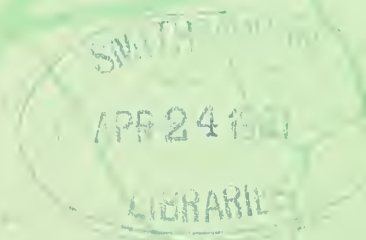




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# Polynesian Plant Studies 6-18

F. RAYMOND FOSBERG  
and  
MARIE-HÉLÈNE SACHET



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# Polynesian Plant Studies 6-18

*F. Raymond Fosberg  
and Marie-Hélène Sacht*

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## ABSTRACT

Fosberg, F. Raymond, and Marie-Hélène Sachet. Polynesian Plant Studies 6-18. *Smithsonian Contributions to Botany*, number 47, 38 pages, 6 figures, 1981.—The thirteen short taxonomic studies on Polynesian plants presented here deal with the genera *Tricholaena* Schrader, *Oxalis* L., *Claoxylon* A. Jussieu, *Abutilon* Miller, *Zehneria* Endlicher, *Terminalia* L., *Myrsine* L., *Geniostoma* Forster, *Rauwolfia* L., *Leucas* R. Brown, *Cyrtandra* Forster, *Dicrocephala* L'Héritier, and with a number of miscellaneous distributional and nomenclatural records in other genera. The paper is a continuation of Polynesian Plant Studies 1-5, *Smithsonian Contributions to Botany*, number 21, issued 21 July 1975, and is precursory to floristic studies in Polynesia.

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# Polynesian Plant Studies 6-18

*F. Raymond Fosberg  
and Marie-Hélène Sachet*

## Introduction

Continuing exploration and study of the floras of Polynesian islands have turned up a number of new plants, several of them quite remarkable. Of especial interest are a new woody species of *Oxalis* of obscure relationships, a group of island species of *Abutilon* with large showy calyces, a *Rauwolfia*, and several new *Cyrtandra* taxa. The genus *Geniostoma* continues to yield new species in the *G. rupestre* assemblage. Critical taxonomic and nomenclatural studies of *Tricholaena*, *Terminalia glabrata*, *Leucas*, *Cyrtandra*, and *Dichrocephala integrifolia* are offered, providing correct identities and names for groups that have been troublesome. Miscellaneous minor taxonomic notes and range extensions are provided in study 18.

Material kindly furnished by Betsy Gagné, P. A. Schäfer, and W. R. Sykes has been of importance in these studies, as have been older collections loaned by the Laboratoire de Phanérogamie of the Muséum d'Histoire Naturelle, Paris, and by the B. P. Bishop Museum, Honolulu. The hospitality and cooperation of the authorities of the herbaria where we have visited are greatly appreciated. Travel and other expenses have been met in part by grants from the Smithsonian Research Awards Program, and the Smithsonian Fluid Research Fund. A generous grant from the National Geographic Society supported the field

work of the junior author, several field assistants, and facilitated close cooperation with other naturalists engaged in their own projects in the same islands. The work of Alice R. Tangerini and Christopher R. Reinecke in making the illustrations, and of Dulcie A. Powell in dissecting and sketching difficult specimens is gratefully acknowledged.

The first five studies in this series were published as *Smithsonian Contributions to Botany*, number 21, issued 21 July 1975. As in that paper, we here indicate, by citing collector's names and numbers in italics, whether we have examined the specimens cited. The herbaria where the specimens are deposited are indicated by Lanjouw system herbarium symbols as listed in the sixth edition of *Index Herbariorum* (Holmgren and Keuken, 1974). Additional symbols are Fo, for plants still in our hands, and LeB for the LeBonnec set of Marquesas specimens.

## 6. *Tricholaena* Schrader (Poaceae) in the Pacific Islands<sup>1</sup>

### *Tricholaena* Schrader

*Tricholaena* Schrader in Schultes, Mant., 2:8, 1824.

*Rhynchelytrum* Nees in Lindley, Nat. Syst., ed. 2, 446, 1836.

*Tricholaena* and *Rhynchelytrum* are names applied to two closely related groups of panicoid grasses

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<sup>1</sup> Fosberg sole author of study 6.

widely distributed in Africa and Arabia. They are considered distinct genera by many modern floristic writers. This seems to be largely on the authority of C. E. Hubbard, who, as far as known to us, has never published any discussion giving the reasons for regarding them as distinct.

This would not be cause for much interest on the part of flora writers of other regions were it not for the widespread introduction in warm regions, including Polynesia and Micronesia, of a handsome but weedy ornamental grass of this affinity, usually called either *Tricholaena rosea* or *Rhynchelytrum repens*. In California and a few other places it is occasionally planted in gardens for its beautiful fluffy bright pink to old-rose panicles. This is probably how it gained its present pan-tropical distribution outside its native Africa, as it does not seem to be highly regarded as a pasture grass.

For the plant long known as *Tricholaena rosea*, usage changed, first to *Tricholaena repens* on the authority of A. S. Hitchcock, then almost at once, to *Rhynchelytrum roseum* and then *R. repens* on the authority of C. E. Hubbard. Acceptance of these changes seems mostly to have been uncritical, following these authorities. Before accepting any of the four available names, their taxonomic and nomenclatural status should be examined. A comparison of the descriptions of the two genera in Phillips' book (1951:103–104) shows only one character of more than trivial value that distinguishes them: two stamens per floret in *Tricholaena*, three in *Rhynchelytrum*. A few minor features such as gibbosity versus slight curvature of the upper glume, and the presence or absence of a distinct tiny internode between the lower and upper glumes are regarded as diagnostic in Hubbard's keys (e.g., in Hutchinson and Dalziel, 1936:501).

An examination of the available material of the two genera in the excellent grass collection of the U.S. National Herbarium shows little or no difference in habit or general physiognomy. Examination of spikelets of the commonest species of each genus under a fairly high magnification shows a striking similarity in their architecture,

supporting the almost word-for-word identity in the generic descriptions, except for the number of stamens. We are unable to confirm from dried material available the "lateral" emergence of the styles from the spikelet in *Rhynchelytrum*, probably from lack of specimens in exactly the right stage. In *Tricholaena teneriffae* the styles emerge apically.

The number of stamens, 3 versus 2, is regarded as a specific difference within some grass genera, e.g., *Sporobolus* (Bor 1960:623; Clayton 1965:293) but scarcely seems sufficient to separate genera without other correlated substantial differentiation. The lack of anything in the ensemble of minor characters making up "habit" seems to us especially significant. We therefore choose to recognize only one genus, for which *Tricholaena* Schrader is the oldest and therefore the correct name.

The change to the specific epithet *repens* has been accepted as uncritically as that to the generic name *Rhynchelytrum*. Hitchcock made the transfer on the basis of an examination of the type of *Saccharum repens* by Pilger. Pilger said it was identical with *Tricholaena rosea* (letter, 2 July 1934, filed in the type collection, U.S. National Herbarium). Willdenow's description does not mention the characteristic red color of the hairs on the spikelets but says, "Flores geminati sessiles candidis obvallatis." Hubbard, in a letter, dated 17 January 1935, filed with that from Pilger, equates the two, but in a later letter, restricts *Rhynchelytrum repens* to West African forms, referring other African material to *R. roseum*. Agnes Chase (1950:947) regarded *R. rosea* as distinct, saying, "Has been confused with *R. repens* (Willd.) C. E. Hubb., a pale flowered annual from West Africa." In the U.S. National Herbarium, where the two are not separated, there are a number of sheets of such a pale-flowered plant, which seems a distinct species, but which is not confined to West Africa. It is difficult to separate, however, from old, faded examples of *Tricholaena rosea*.

The widely introduced reddish panicked plant, seen in many tropical countries, including a number of Pacific islands, is remarkably uniform. In



Africa it is more variable, but this may largely be due to confusion of two or more species.

### *Tricholaena repens* (Willdenow) Hitchcock

*Tricholaena repens* (Willdenow) Hitchcock, Man. Grasses W. Indies, 331, 1936.

*Saccharum repens* Willdenow, Sp. Pl., 1(1):332, 1797.

*Rhynchelytrum repens* (Willdenow) Hubbard, Kew Bull., 1934: 110, 1934.

Specimens we have seen with pale spikelets that are probably *Tricholaena repens* are listed below but none of these have been compared with the type collection from Guinea, which was collected by Isert and is in the Willdenow Herbarium (B) with an isotype said to be in Copenhagen (C).

SPECIMENS SEEN.—AFRICA: NIGERIA: Lokoja, *MacLeod* 25 (US); Toro, 20 mi [32 km] E of Jos, 3500 [975 m], *Semple* 172A (US); Febba, 35 m, *Hagemp* 731 (US). BELGIAN CONGO [ZAIRE]: s.l., *Stilz* in 1935 (US). SOUTH AFRICA: Kalahari Desert, 40 mi [65 km] NW of Vryburg, *Rodin* 3592 (US); Griqualand West, Kimberley, Wimbledon, *Ferrar* 31909 (US); Cape Province, 5 mi [8 km] E of Barkly West, 4000 ft [1220 m], *Oakes* 558 (US); Garspan near Andalusia, *Schweichurt* 1485 (US).

### *Tricholaena rosea* Nees

*Tricholaena rosea* Nees, Cat. Sem. Hort. Vratisl. a., 1836; Fl. Austr., 17, 1841.

*Rhynchelytrum roseum* (Nees) Stapf and Hubbard ex Bews, World's Grasses, 223, 1929; in Prain, Fl. Trop. Afr., 9:880, 1930.

This species is represented in the U.S. National Herbarium from a number of Pacific islands (specimens cited below) as well as from New Guinea, Java, Philippines, and Taiwan. The earliest dates on any of these specimens are 1909, a collection by *Faurie* and another by *Rock*, from the Hawaiian Islands, where it is said to have been found since about 1890, according to Neal (1965). Dates on specimens from the other island groups are all much later. The specimens cited below are representative of the Pacific Islands range of the species as known to us.

SPECIMENS SEEN.—MARIANAS ISLANDS: Saipan, S side of Kagman Peninsula, W of Kagman Pt., 30 m, *Fosberg*

31298 (US, BISH, Fo, NY). Guam: Apra Harbor OSIR Rd., *Stone* 4715 (GUAM); Agaña, *Stone* 4371 (GUAM, US); Tamuning, *Fosberg* 35252 (US, BISH, Fo, NY, L). MARSHALL ISLANDS: Eniwetok, Japtan I., *Taylor* 46-1296 (US). FIJI ISLANDS: Viti Levu, Mba, vicinity of Malotawa, E base of Mt. Evans Range, 550–600 m, *Smith* 4259 (US). NEW HEBRIDES, s.l., *Burton* 7 (US); Esperitu Santo, *Burton* S-24 (US). NEW CALEDONIA: W side Mt. Mou, 1 mi [1.6 km] from Col de Pirogue, 130 m, *Buchholz* 1543 (US). TONGA ISLANDS: Tongatabu, Vahe Hahake, *Setchell & Parks* 15346 (US); trail Tu'amotu to sea, *Yuncker* 15151 (US). Vava'u, N side above Leimatua, 150 m, *Yuncker* 16068 (US). Eua, plateau, *Parks* 16237 (US); above village of Houma, district of Toafotuloi, 120–180 m, *Yuncker* 15490 (US). COOK ISLANDS: Rarotonga, *Philpson* 10394 (US). SOCIETY ISLANDS: Tahiti, Fare Rau Ape, above Papeete, 650 m, *Fosberg & Sachet* 54557 (US). MARQUESAS ISLANDS: Uapou, Hakahetau village, 10–15 m, *Decker* 2275 (US). Hivaoa, Miti tauao'o, hill on SW corner of Puamau Bay, 35 m, *Decker* 641 (US). HAWAIIAN ISLANDS: Kauai, Hanauaulu, *Faurie* 1354 (US). Oahu: Schofield Barracks, *Hitchcock* 13980 (US); Pearl Harbor, *Correll* 12304 (US); Wahiawa, *Degener & Whitney* 11045 (US); Kailua Beach, 1 m, *Oliveira* in 1939 (US); Makapuu Head, 200 ft [60 m], *Webster* 1348 (US); Honolulu, Kaimuki, *Chase* 12676 (US); *Forbes* 1938.0 (US); W. Molokai, *Hitchcock* 15150 (US); Hoolehua, *Degener* 9157 (US); Puu Lauhine, 595 ft [180 m], *Spence* 108 (US). Maui: Pukalanania, *Spence* 68 (US); Papawai Pt., 7.5 mi [12.1 km] S of Wailuku, 40 ft [12 m], *Henrickson* 3808 (US). Hawaii: Kukaiau Ranch, 3600 ft [1095 m], *Hitchcock* 14206 (US); Kukuiahaele, *Rock* 4511 (US); Kamuela, *Goff* 12 (US).

## 7. A New Woody *Oxalis* L. (Oxalidaceae) from the Marquesas

Recent Marquesan collections by P. A. Schäfer and by Betsy H. Gagné include specimens of a remarkable new *Oxalis* without close relatives at least in the Pacific Islands.

### *Oxalis gagneorum* Fosberg & Sachet, new species

FIGURE 1

Frutex parvus valde lignosus, pilosus, foliis trifoliolatis petiolatis, folioliis late obovatis sessilibus ad apices rotundatis, infra glaucis; cymis valde condensatis, floribus petiolatis flavis, sepalis lanceolatis membranaceis, petalis unguiculatis mem-

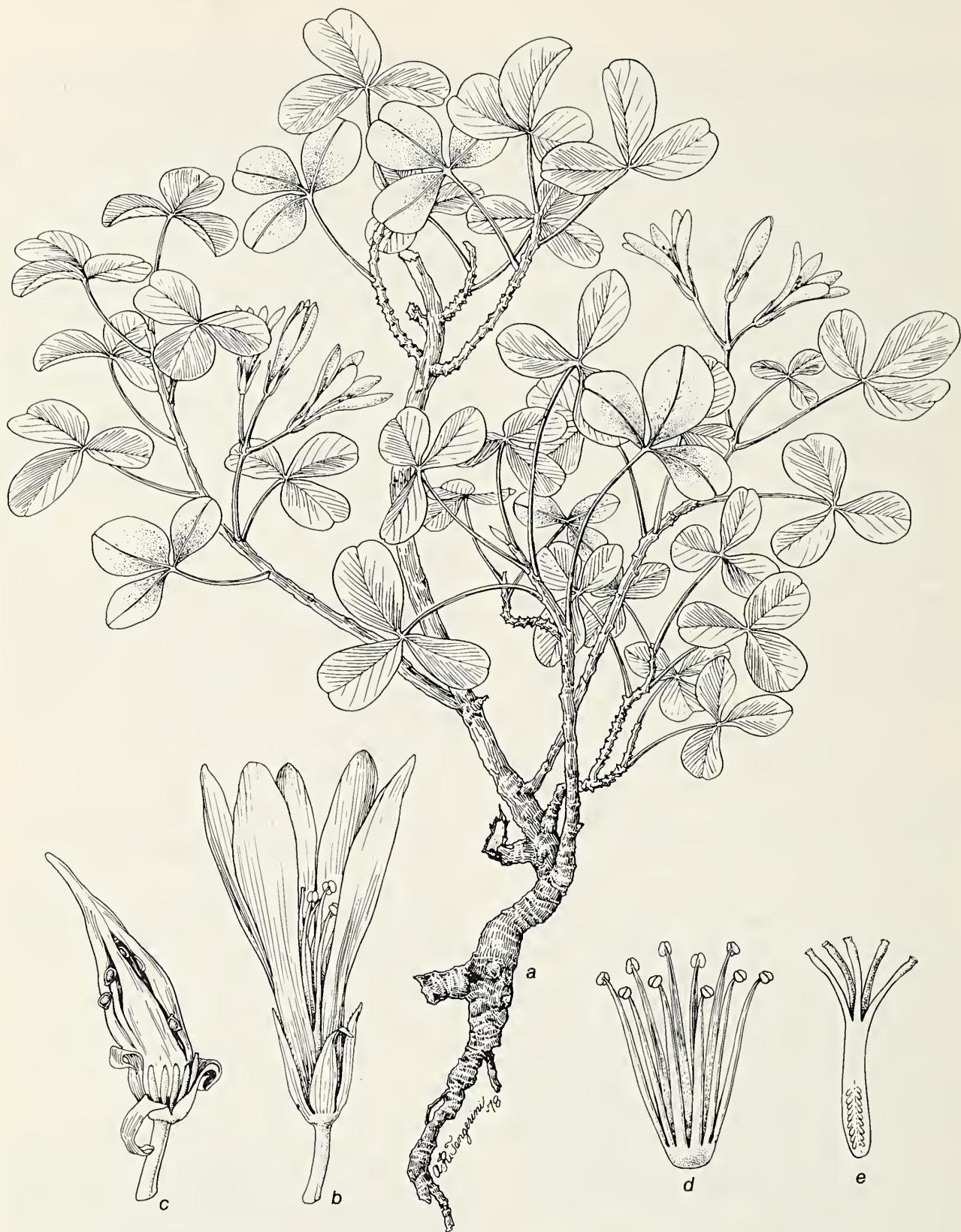


FIGURE 1.—*Oxalis gagneorum* Fosberg & Sachet: *a*, habit (*Gagné 1216*, type collection)  $\times 0.6$ ; *b*, flower; *c*, young fruit; *d*, stamens; *e*, gynoecium (*b-e*  $\times 2$ ). (Drawn by Alice R. Tangerini.)



branaceis 15–25 mm longis; staminibus 12–14 et 14–16 mm longis, pistillo 13 mm, stylis 5 ad apices truncatis. Type: Marquesas, Fatuiva, *Gagné 1216* (US, holotype; BISH, P, isotypes).

Freely branched small shrub to 0.3–0.4 m tall, stems terete, hard, very woody, pith very small, bark smooth, dark chocolate brown, small twigs conspicuously tuberculate with persistent leaf bases and leaf and bud scars, young growth pilose; leaves crowded on apical several cm of twigs and on dwarf lateral branchlets, trifoliate, leaflets firm, sessile, broadly obovate, up to  $3.5 \times 2.6$  cm, apex rounded or almost imperceptibly retuse, base broadly cuneate to obtuse, upper surface green, glabrous, under surface glaucous, notably appressed pilose, veins 5–6 pairs, not very conspicuous, petioles 2–4 cm long, straight, pilose or appressed pilose to tomentulose or almost glabrous, leaf-base abruptly expanded into a densely pilose, hard, persistent clasping flange-like ridge that may represent stipules, stipules otherwise not evident; cymes in upper axils, peduncle slender, terete, 5–25 mm long, sparsely pilose, with a pair of ovate-subulate bracts at summit subtending a pair of very reduced branches, with between them a pedicel about 0.5–1.0 cm long bearing a flower, the branches each bearing 1 or 2 pedicellate flowers or these reduced to subsessile ovoid bracteate buds, the whole ramified portion very condensed, the bracts lanceolate and villous-ciliate to very pilose; sepals membranous, pale, broadly lanceolate, about 5–6 mm long, erect, sparsely pilose; petals (5–8), yellow, clawed, claws narrowing to 1.5–1.0 mm wide, 5–10 mm long, erect, claw and blade 10–12-veined, very thin, blade broadly elliptic to obovate, obtuse, spreading to reflexed, faintly ciliolate, about 1–1.5 cm long; stamens 10, filaments flat, lower portions weakly coherent, in 2 series, the shorter 12–14 mm, the longer 14–16 mm long, coherent to varying heights, anthers oblong less than 1 mm long; pollen bluish; style 2–6 mm long, with 5 branches, the whole not quite equalling to exceeding longer filaments, glabrous, apically abruptly truncate, stigmatic surfaces terminal, flat, ovary lanceolate in outline about 8 mm long including tapering

apical portion; fruit broadly cylindric,  $9-10 \times 3-4$  mm, tapering apically to a beak 1.5 mm long, styles recurved, 5-costate, costae minutely glandular, intercostal areas less so; seed glossy, brown, gently rugose, oval, about  $1.0 \times 1.2$  mm (somewhat immature).

This remarkable species adds another to the assemblage of woody species in primarily herbaceous genera found in eastern and northern Polynesia. Its relationships are obscure, but it possibly belongs to section *Caledonicae* (= section *Neocaledonicae*) Knuth, based on *O. novae-caledoniae* Knuth & Schlechter, from which it differs conspicuously in its non-obcordate leaflets, stouter stems, cymes not reduced to single flowers, clawed petals, much longer stamens, and glabrous much longer style subequal with stamens. It possibly might constitute a section of its own, or it could belong to one of the woody South American sections. This may not be determined with certainty until mature seeds are collected. The material was examined by Dr. Alicia Lourteig, who in the absence of mature seeds, hesitated to place it in any of the sections recognized in her manuscript monograph of the genus.

**SPECIMENS SEEN.**—MARQUESAS ISLANDS: Eiao: NW side of island, Vituha Bay, windward cliff, 400 m, *Gagné 1296* (US, BISH). Hivaoa: Taaoa, lieu-dit Faevea, falaise, 560 m, *Schäfer 5895* (US, BISH, P, MPU). Fatuiva: Sentier d'Ouia vers Omoa, crête au-dessus de la vallée d'Ouia, S col de Teava, rochers, 680 m, *P. A. Schäfer 5844* (US, BISH, P, MPU); Teavapuhiau Pass (above Ouia Valley), almost inaccessible, rocky windward cliff faces, 700–785 m, *Gagné 1216* (US, holotype; BISH, P, isotypes).

### 8. A New *Claoxylon* A. Jussieu (Euphorbiaceae) from the Marquesas

The genus *Claoxylon* A. Jussieu is widely distributed in the Pacific islands but has not heretofore been reported from the Marquesas. It is already known in northern and eastern Polynesia from Hawaii, Tahiti, and Rapa. What is certainly a *Claoxylon* was collected in sterile condition by Betsy H. Gagné in 1977, on Nukuhiva Island. Several plants were seen “jutting out through ferns . . . trilobed fruit heavily eaten by rats (prob-

ably); non-milky sap, grass-green leaves, plants up to 3 m." The leaves are large, ovate or very broadly elliptic, up to  $30 \times 21$  cm, obtuse at apex and base, margin serrate-dentate, and both surfaces very rough, rasp-like, as is frequent in *Claoxylon*. The petioles are up to 12 cm long and 4 mm thick when dry. Unfortunately no fruits remain on the specimens.

A similar gathering from the same general locality was collected by Adamson & Mumford in 1929. Three sheets of this, US, NY, and LeB, are sterile. The Bishop Museum sheet has a pistillate raceme with several flowers. This latter specimen confirms our generic identification as *Claoxylon* and clearly represents a new species, which is here described.

***Claoxylon ooumuense* Fosberg & Sachet,  
new species**

Frutex, caule 6–9 mm crasso, foliis lato-ovatis vel oblongis maxime  $30 \times 21$  cm, racemo brevi 3 cm paucifloro, pedicello a bractea deltoidea subtento, floribus ca 3 mm longis latisque, sepalis 3 deltoideo-ovatis, glandibus disci in cupula connatis, ovario late ovoideo, glabro a 3 ovatis crassis sessilibus stigmatibus coronato, fructu trilobato. Type: Marquesas, Nukuhiva, *Adamson & Mumford 584* (BISH, holotype; US, NY, LeB, isotypes).

Shrub to 3 m, apparently dioecious, the youngest parts sericeous tomentose, stems thick (6–9 mm), apparently somewhat fleshy; leaves ample, drying very rough, from numerous sand-like cystoliths, broadly ovate to oblong or suborbicular, to  $30 \times 21$  cm, apex obtuse to acutish, umbonate or slightly acuminate, thickish, main veins 7–8 on a side, midrib and sometimes main veins sparsely appressed-villous, main veins connected by slanting somewhat sinuous veins, between which is a network, margin obscurely to clearly remotely very low-serrate, the teeth with indurate bluntish to conic points that do or do not curve more or less inward, even on the same leaf, petioles thick, fleshy, 3–12 cm long, leaving a bluntly triangular to heart-shaped scar; stipules not available (or minute, ovate and sericeous hirsute?) but 2 elongate or somewhat triangular scars present at base of petiole; inflorescence a few-flowered raceme about 3 cm long, rachis subappressed hirsute, pedicels thick, 2–3 mm long, glabrate, subtended by triangular sheathing scale-like bracts, hirsute on outer surface, blunt-pointed; flowers about 3 mm long and wide, sepals 3, broadly triangular-ovate, slightly united at base, bluntly pointed, erect, strigose on outer surface; disk glands apparently united into a glabrous cup about half as high as the ovary (with a suggestion of an appendage between some sepals), ovary broadly ovoid, glabrous, with 3 spreading, flattish, ovate fleshy sessile stigmas on top; fruit said by one collector to be trilobed, but not available on specimens.

The male plant is unknown.

This species seems very distinct, not closely resembling any to which we have been able to compare it. Its very short few-flowered racemes, large erect calyx-lobes, and very large leaves on long fleshy petioles are distinctive. It possibly belongs to section *Indicum* Pax, but without staminate flowers this cannot be determined with any confidence.

SPECIMENS SEEN.—MARQUESAS ISLANDS: Nukuhiva: spur of Mt. Ooumu, Tovii Plateau, *Gagné 1115* (US, BISH); Ooumu Mt., 3500 ft [1070 m], *Adamson & Mumford 584* (BISH, holotype; US, NY, LeB, isotypes).

**9. *Abutilon* Miller (Malvaceae) in Southeastern  
Polynesia and Samoa:  
The *Abutilon sachetianum* Group<sup>2</sup>**

Three hitherto undescribed species of *Abutilon* in southeastern Polynesia and one in Samoa seem to form a closely related group, very distinct from anything else known from the Pacific. One of them, here christened *Abutilon sachetianum*, is represented by excellent material and is very fully described. It is very rare but still exists on at least two of the Marquesas Islands, Hivaoa and Mohotani. Two of the others were collected on the Mangarevan Expedition in 1934, and were even

<sup>2</sup> Fosberg sole author of study 9.



then almost extinct. They are very likely extinct now, but I am describing them, even from inadequate material, with the hope that their publication may stimulate efforts to relocate them, and to bring about their protection, as well as to place on record our knowledge of them. The Samoan species, *A. whistleri*, was found by Christophersen in 1931 but lay undescribed until Art Whistler recently discovered its flowers.

It is not possible to characterize the group adequately since two of the species are too poorly known. Calyces in the group are similar, large, hemispherical or broadly campanulate with ovate or triangular lobes, and with pedicels jointed near the summit. *Abutilon sachetianum* and *A. mangarevicum* have subulate processes or spines on the fruit. The fruit of *A. whistleri* is muticous and densely hirsute. The fruit of *A. pitcairnense* is unknown. Their general similarity in appearance, with their flowers on axillary racemes or branchlets, as well as their geographical occurrence, seem close enough to justify tentatively associating them.

### ***Abutilon sachetianum* Fosberg, new species**

#### FIGURE 2

Arbor parva, foliis rotundis, stellatis, racemo laxo, gracili stellato-pilosi, floribus 3–5, longipedicellatis, calyce late-campanulato membranaceo stellato, lobis deltoideis, corolla calycem subaequant, glabra, androecio incluso, antheribus plurimis reniformibus, carpellis 10, sublibris stellatis lanceolatis, longo-subulatis, seminibus compressis asymmetricis sparse squamatis. Type: Marquesas Islands, Hivaoa, *Oliver & Schäfer 3193* (US, holotype; BISH, P, isotypes).

Shrub or small tree to 8 m tall, 20 cm diam., bark thin, pale brownish gray, wrinkled and fissured longitudinally, branches with short, close, stellate tomentum and abundant short, straight, spreading hairs; leaves strongly cordate, orbicular-ovate, 9–15 cm across, 10–17 cm long, on long petioles, sinus deep, nearly to quite closed at base, margins very slightly and irregularly crenate or undulate, apex acuminate, upper surface mi-

nutely and thinly stellate puberulent, lower surface more prominently stellate pubescent, pubescence of petioles as of branches; nervation palmate, 9-nerved from base, two outer nerves much reduced, secondary nervation pinnate, the nerves once again pinnate but only on outer side, nerves connected by a ladder-like further nervation, with intervals containing a rather coarse network, margin ciliate, and with a minute, dense tuft of pubescence wherever a nerve reaches the margin; stipules linear-subulate, pilose, very early caducous, leaving small but prominent elliptic scars, the stipules between bracts in young inflorescences broader, lanceolate-subulate; inflorescence an axillary, lax raceme, with a very few reduced leaf-like bracts or usually none, up to 9 cm long, very slender, stellate pilose, with up to 5 slender elongate “pedicels” (really inflorescence branches plus pedicels) 3–5 cm long, jointed 3–9 mm below calyx, flowers described by collectors as “pendent” but on dried specimens appearing either erect or cernuous; calyx ample, broadly campanulate, from base to tips of lobes 2–2.5 cm, pale green, membranous, densely stellate pubescent within and without, with rather obscure finely anastomosing venation, lobes broadly triangular, somewhat to quite acuminate; corolla yellow, glabrous, subequal with calyx, attached well above base of staminal tube, blades rounded, veins fine, anastomosing forming a network near margin; filament tube about 10–12 mm long, swollen below, contracted upward, glabrous, free filament tips about 2.5 mm, numerous, anthers plump, reniform, dehiscing along outer curve along a shallow furrow, pistil at anthesis completely covered by the androecium, stigmas not showing among anthers, ovary densely stellate-tomentose, 1–1.5 mm high, broadly ovate, somewhat sulcate, united part of style about 1–4 mm long, branches 8–10, unequal, 2.5–5 mm, stigmas irregularly capitate, completely included; fruiting calyx spreading, flat, star-shaped, up to 6 cm across; the 8–10 mature fruiting carpels to 17 mm long, free almost to base, densely stellate pubescent without, lanceolate in basal half, distally arcuate and long acuminate subulate, spreading,



FIGURE 2.—*Abutilon sachetianum* Fosberg: a, habit (Oliver & Schäfer 3193, type collection)  $\times 0.6$ ; b, c, flower  $\times 1.8$ ; d, fruits  $\times 1.8$ ; e, close-up of leaf surface  $\times 21.6$ . (Drawn by Alice R. Tangerini.)



dehiscent along both sutures to base; apparently one seed maturing in the basal part of a carpel, slightly compressed, about 2 mm across, strongly asymmetric, with a prominent straight linear attachment, surface dull brown, sparsely beset with thick irregular wart-like paler brown excrescences bearing erect (or rarely appressed) pointed stiff hairs, these forming roughly circular or irregular open clumps.

The floral biology of this species, insofar as it can be guessed at from dried material, seems very unusual. As described above, the gynoecium is completely enclosed by the flask-shaped staminal tube, which is so constructed above that it seems very unlikely that much or any pollen from the pompon-like cluster of anthers above could sift down and land on the capitate stigmas on the short style-branches within. On the same plant in different flowers the style varies greatly in length, possibly with age.

After the basally united corolla and androecium wilt they separate by a circumscissile dehiscence from the receptacle. The carpels grow, remaining erect and connivent until the cap-like remains of the corolla and staminal apparatus are gradually finally pushed off. Then the carpels separate and spread, enlarging and forming the elongate fruiting follicles, in the center of the enlarged broadly campanulate, showy petaloid calyx. This behavior was observed in cultivated specimens growing in the Pacific Tropical Botanical Garden, Lawai, Kauai, Hawaiian Islands. The two plants there produced abundant fully grown fruit, but all examined were sterile, no seeds developing. We were informed that the pollen had been examined at the Garden and proved to be abortive. The calyx has a curious arrangement of the pubescence internally. In the center is a star-shaped area of very fine matted hair. Surrounding this is a broad band of long, stellate rather stiff, dense pubescence changing toward the margin to equally dense but shorter stellate pubescence extending to the margin. In this pubescence, on some of the specimens examined, is an accumulation of pollen.

A chromosome number of  $2n=28$  was deter-

mined from plants grown from seed of *Schäfer 5563* by Royce Oliver. This number has been found six times previously in the genus (Fryxell, in litt.) though most of the counts have yielded  $2n=14$ , 16, and 42.

Subsequently, material of the *Lucas* collection and of *Fosberg and Sachet 59503*, including pickled flowers, was restudied by Oliver to determine the nature of the pollen. No pollen whatever was found, and the androecia of all flowers examined were crumpled and unexpanded, the free parts of the filaments short, the anthers poorly developed, and the styles elongated so the stigmas were exerted well beyond the androecia.

Then a reexamination of all material from the Marquesas was undertaken, and all available flowers were restudied. One collection, *Schäfer 5683*, from Mohotani Island, and another, *Schäfer 5563* from Hivaoa Island, with seeds, had the androecia poorly developed, exactly as in the cultivated specimens, with no pollen at all. The other flowering collections all had well-developed androecia and short styles, as in the description of the species, above. All had pollen, but not in abundance. The pollen seemed normal.

Our conclusion is that the species is gyno-dioecious, a condition rare in the Malvaceae and hitherto unreported in *Abutilon*, according to Paul A. Fryxell (pers. comm., 13 May 1980).

**SPECIMENS SEEN.**—MARQUESAS ISLANDS: Hivaoa: Hanaheka Valley, 300 m, *Oliver & Schäfer 3193* (US, holotype; BISH, P, isotypes); Tepehi, above Hanamenu, dry, about 400 m, June 1929, *PES (M & A) 424* (BISH, LeB, NY as *A & M*), "fautea," "indigenous," "flower white" [the flower referred to may have been the accrescent calyx]; Hanamenu, Motutapu, partie centrale, *Schäfer 5563* (US, MPU). Mohotani: Est de Mata'ai, *Schäfer 5538* (US); partie centrale, *Schäfer 5683* (US); Momoei, about 200 m, 13 Aug 1929, *PES (M & A) 539* (BISH, LeB, NY as *A & M*); vallée de Mataeva, *Schäfer 5949* (US). HAWAIIAN ISLANDS: Kauai: cultivated in Pacific Tropical Botanical Garden from seeds from *Schäfer 5563*; *Scott Lucas s.n.* (US); *Fosberg & Sachet 59503* (US, BISH).

### *Abutilon mangarevicum* Fosberg, new species

*Arbuscula gracilis* dense stellato-tomentulosa, foliis cordatis marginibus crenatis vel obtuse den-

tatis, floribus congesto-subpaniculatis, calyce hemisphaerico, 7 mm lato, lobato, cernuo ecarinato, corolla aurantiaca, mericarpio breve-piloso bispinoso fragile, seminibus binis superpositis. Type: Gambier Islands, Mangareva, *Fosberg 11092* (BISH, holotype).

Slender sprawling shrub, stems 1–1.2 m long, or erect, very minutely and closely stellate-tomentulose; leaves orbicular or suborbicular-cordate, to  $7 \times 5$ –6 cm, acute to acuminate, finely stellate on nerves above, generally and rather densely so beneath, palmately 7-nerved from base, margins crenate or obtusely dentate, petioles stellate-tomentose, 2.5–3 cm long, stipules broadly linear  $5 \times 0.6$  mm, 1-nerved, caducous, scar round, becoming thickened, callus-like; flowers subpaniculately crowded terminally and in upper axils, cluster about 5 cm long; calyces hemispheric, densely stellate-tomentose, not at all keeled, about 7 mm wide, nodding in fruit, lobes triangular-acuminate, 3–4 mm long, appressed hirsute within, tube glabrous within; corolla dull orange-yellow, exceeding calyx, veins visible in petals; fruit body shortly pilose dorsally, 2.5–4 mm long, with 2 slender spines 2.5 mm long, these flattened at base; fruit wall thin and fragile, seeds 2 in each carpel, superimposed.

*Abutilon mangarevicum* is closest to *A. pitcairnense*, differing in leaf dentation and in much smaller flowers. The local name is said to be “tutu.”

**SPECIMENS SEEN.**—GAMBIER ISLANDS: Mangareva: Agakauitai I., E side, 30 m, *St. John 14914* (BISH), sterile; Mangareva I., Mt. Duff, NE slope, 100 m, edge of forest, *Fosberg 11092* (BISH, holotype).

### ***Abutilon pitcairnense* Fosberg, new species**

Arbuscula dense stellato-tomentosa, foliis orbiculari-cordatis, subcrenatis supra sparse- infra dense-stellatis, cymis in ramulis brevibus lateralibus paucifloris, floribus cernuis, calycibus grandis 15 mm latis hemisphaericis, lobis rotunde ovatis vix cuspidatis carinatis intus infra glabris, antheris siccis U-formibus. Type: Pitcairn Island: *St. John 14966* (BISH, holotype).

Densely stellate-tomentose shrub, young

growth tending toward a tawny color, stems without simple hairs; leaves orbicular-cordate, petioles strong, 6–8 cm long, blades up to  $13 \times 9$  cm, slightly acuminate, basal sinus to about 2 cm deep, margin somewhat crenate, not very clearly so, upper surface sparsely stellate with some short, apparently simple hairs, green, under surface rather densely stellate-tomentose, when mature venation strong beneath, 7-veined from base, tertiaries perpendicular to main nerves, rather ladder-like, loosely anastomosing where they meet; stipules oblong-lanceolate to linear, stellate, early caducous; flowers in several-flowered cymes terminal on lateral branchlets in upper axils, on peduncles jointed at summit to a very short thickened pedicel, the peduncle to 3 cm long, flowers nodding, at least in bud, calyx large, hemispheric, about  $15 \times 15$  mm, finely and very closely stellate-tomentose, lobes rounded-ovate, about half the length of the calyx, rather leathery in texture, glabrous within, except slightly stellate near tips, outside with a strong ridge in upper part leading to the slightly cuspidate apex; corolla pale yellow, seen only in bud, at least twice length of calyx, venulose and finely reticulate; anthers when dry strongly bent into a U-shape. Open flowers and fruits lacking.

This species is certainly close to the one described above as *Abutilon mangarevicum*, but has flowers twice as large, calyx lobes with a strong keel, besides minor differences in leaf characters. The material available is not very adequate, especially in the lack of fruits, but its occurrence on remote Pitcairn Island may justify drawing attention to it. The local name is “fautou.”

**SPECIMEN SEEN.**—PITCAIRN ISLAND: Parlver Valley Ridge, 300 m, *St. John 14966* (BISH, holotype).

### ***Abutilon whistleri* Fosberg, new species**

Arbor ad 18 m, partibus juvenilibus dense furfuraceis sparsim hirsutisque, foliis ovatis cordatis acuminatis petiolatis supra tenuiter, infra dense stellatis sparsim hirsutisque, stipulis linearibus cito caducis, racemis axillaribus paucifloribus, petiolis 1.5–2 cm longis, floribus calice 1



cm longo ad medium lobato, corolla alba, staminali columna nuda filamentis ad summum congestis, fructibus depresso-globosis apicibus truncatis muticis, segmentis circa 19 dense stellatis. Type: Samoa, *Christophersen* 2677 (BISH, holotype).

Tree, 15–18 m, 30 cm diameter, stems when young closely and densely and irregularly minutely stellate, with a few long hairs; leaves ovate to orbicular-cordate, apex acuminate, basal sinus narrow to overlapping, margins irregularly, shallowly dentate, upper surface thinly beset with minute stellate hairs and with scattered long simple hairs, under surface similar but much more densely stellate and with many long simple hairs on nerves, 5 main nerves and 4 smaller ones from base, pubescence of petiole similar to that of stems, petiole 5–6 cm long, blade to 13 × 10 cm; stipules linear, blunt, 5 mm long, very early caducous, densely stellate; inflorescence an axillary few-flowered raceme up to 7–10 cm long, pubescent as in stems, “pedicels” 1–2 cm long, jointed at middle; flowers white, 2–2.5 cm long, calyx 1 cm long, campanulate, lobed to middle, lobes oblong-ovate, obtusish, densely and finely stellate, caducous from fruit; good corollas not seen, staminal column bare, glabrous, 1 cm high, with a dense pompon of free filaments at summit; style branches and stigmas not seen; fruit depressed globose, 10 mm high, 12–14 mm wide, apex truncate, segments about 19–20, densely stellate, hairs longer on ribs toward summit, apices of segments rounded, completely muticous; seeds not available.

This Samoan tree, in spite of the different fruit, seems to belong with the Eastern Polynesian group described here, on the basis of its arborescent habit, axillary racemes, and large calyx. It is named for Art Whistler, who first associated flowers with Christophersen’s fruiting specimens. The native name is “fau pata.”

**SPECIMENS SEEN.**—SAMOA: Savai’i I.: above Salailua, in wet forest, 1300–1400 m, *Christophersen* 2677 (BISH, holotype; US, NY, isotypes); behind village of Aopo, 1140 m, *Whistler* W 2476 (BISH) [“fau pata”; flowers from ground only].

## 10. New Combinations in *Zehneria* Endlicher (Cucurbitaceae)

### *Zehneria* Endlicher

*Zehneria* Endlicher, Prodr. Fl. Norfolk., 69, 1833.

According to Dr. Charles Jeffrey (pers. comm., also 1962:342–344) the genus *Melothria* L. is to be restricted to the American species, and the Pacific Islands species belong to *Zehneria*. Some of the Pacific Islands species have not yet been transferred to *Zehneria*. We are not ready to do this for all of the western Pacific species, but the one that reaches eastern Polynesia, *Melothria grayana* Cogniaux, seems clearly distinct and will be referred to in a forthcoming paper.

Jeffrey (1962:343–371) does not dispose of the Polynesian species of *Melothria* other than to extend the distribution of *Zehneria mucronata* (Blume) Miquel to Polynesia. As nearly as can be determined from the use of his key, both Samoan species (*M. samoensis* A. Gray and *M. grayana* Cogniaux) belong in *Zehneria*, even though Cogniaux (1881, 1916) put *M. samoensis* (as *M. baueriana* (Endlicher) F. Mueller) in his section *Solena* and *M. grayana* in section *Eumelothria*. Jeffrey’s criteria for separating his genera, which correspond to some extent with Cogniaux’ sections, are quite different from the characters used by Cogniaux, so it is not too disturbing that *M. samoensis* falls into *Zehneria* rather than into the genus *Solena* Loureiro, which Jeffrey says is only Asiatic.

In transferring *Melothria grayana* Cogniaux, which extends as far east as Tahiti, to *Zehneria* it is necessary to take into account that it was described as *Karivia samoensis* Gray. Cogniaux had to rename it on placing it in *Melothria* because of the already existing *Melothria samoensis* A. Gray. The combination with the epithet *samoensis*, however, is not yet preoccupied in *Zehneria*, and would have to be used if *M. grayana* were simply transferred to *Zehneria*. To avoid a confusing change from the familiar epithet *grayana*, it seems desirable to make the other transfer to *Zehneria* also, thus preoccupying the name. The question arises as to whether or not *Melothria samoensis* A. Gray is

or is not identical with *Zehneria baueriana* Endlicher of Norfolk Island.

We have seen no authentic material of *Zehneria baueriana* Endlicher, but comparing the detailed description of *Melothria samoensis* by Gray with Endlicher's excellent plates (1841: pl. 116, 117) of *Zehneria baueriana*, we find them different in many respects, and we have no hesitation about maintaining the two as distinct. Since there has been, to our knowledge, no suggestion of any other disposition of *M. samoensis* Gray, and since it keys to *Zehneria*, we are transferring it to *Zehneria*, making legitimate the transfer of *Melothria grayana* Cogniaux to *Zehneria*. The type of *Melothria samoensis* A. Gray (US) seems much closer to Malesian specimens determined by Merrill as *Melothria indica* Loureiro, of which species we have seen no authentic material, than to *Zehneria baueriana* Endlicher.

We are aware that there is considerable variation in Samoan, Fijian, and Tongan material of this genus, but, until a detailed study can be made, the available specimens seem to fall reasonably into two groups, corresponding to the types of Gray's two species, which we transfer, below, to *Zehneria* Endlicher.

***Zehneria samoensis* (A. Gray)  
Fosberg & Sachet, new combination**

*Melothria samoensis* A. Gray, Bot. U.S. Exploring Expedition, 1:641-642, 1854.

*Melothria baueriana* sensu Cogniaux in A. de Candolle, Mon. Phan., 3:610, 1881, in part [non *Zehneria baueriana* Endlicher, Prodr. Fl. Norfolk., 69, 1833].

*Melothria carnosula* Cogniaux in Fedde, Repert. Sp. Nov., 5: 257, 1908.

Thin, scarcely dentate leaves, long filiform fruiting pedicels, and strongly beaked fruits are features that mark this species. The leaf-shape varies considerably, the type having them more conspicuously triangular than any of the other specimens seen.

Nothing in the description of *Melothria carnosula* Cogniaux is notably different from the material we have referred to *Zehneria samoensis*. We have

not seen the Rechinger collections cited by Cogniaux.

**SPECIMENS SEEN.**—SAMOA: without locality, *U.S. Exploring Expedition* (US, lectotype). Savaii Island, Matavanu lava field, *Christophersen and Hume 1894* (US). Upolu Island: Namu'a Islet, off E end of Upolu, *Whistler 1881* (US); Aleisa, *Whistler 179* (US). Tutuila Island, near Aua, *Setchell 290* (US). Nu'utele Island, Vini, 5 m, *Whistler 4009* (US). NIUE ISLAND: near Hakupu Village, *Yuncker 9652* (US). TONGA ISLANDS: Kao Island, 90 m, *Yuncker 15,877* (US).

***Zehneria grayana* (Cogniaux)  
Fosberg & Sachet, new combination**

*Melothria grayana* Cogniaux in de Candolle, Monogr. Phan., 3:591, 1881.

*Karivia samoensis* A. Gray, Bot. U. S. Expl. Exped., 1:643, 1854 [non *Melothria samoensis* A. Gray, 1854].

This species was first found by Banks and Solander in Tahiti in 1769 on Captain James Cook's first voyage around the world. It was illustrated in a drawing by Sydney Parkinson, which has apparently never been published, but is on file in the British Museum (Natural History). We have a color transparency of it.

The type of Gray's *Karivia samoensis*, collected by the U.S. Exploring Expedition in Samoa and now in the U.S. National Herbarium, matches reasonably well a series of Samoan specimens, cited below. One each from Fiji and New Caledonia do not look exactly the same, but probably fall into Gray's variety *vitiensis*, which is here also transferred to *Zehneria*. In this range of specimens of both varieties there is considerable variation in width and shape of the basal sinus of the leaf.

**SPECIMENS SEEN.**—SOCIETY ISLANDS: [Tahiti], *Banks & Solander* in 1769 (US). SAMOA: without locality, *U.S. Exploring Expedition* (US, lectotype). Savaii Island: Salailua, 100 m, *Christophersen & Hume 2618* (US); NW from Aopo, 100 m, *Whistler 1718* (US); Taga, 10 m, *Christophersen 2836* (US); mountains behind Asau, 450 m, *Whistler 1685* (US); above Palauli, 250 m, *Whistler 1244* (US). Upolu Island: mid-island ridge, La Mafa area, Vaipu, 300 m, *Bristol 2438* (US); "Sameabusch," *Reinecke 60a* (US); near Utumapu, 250 m, *Whistler 1127* (US); crater just west of Mt. Fito, 1050 m, *Whistler 3955* (US).



***Zehneria grayana* var. *vitiensis* (A. Gray)  
Fosberg & Sacht, new combination**

*Karivia samoensis* var. *β vitiensis* A. Gray. Bot. U. S. Expl. Exped., 1:643, 1854.

Variety *β vitiensis* A. Gray is described thus: "foliis supra scabridis; pedunculis fructiferis brevissimis."

SPECIMENS SEEN: FIJI ISLANDS: "Ovalau," *U. S. Exploring Expedition* (US, holotype). Viti Levu, Namosi, hills bordering Wainavindrau Creek, in vicinity of Wainimakutu, 150–250 m, *A. C. Smith 8890* (US). NEW CALEDONIA: Me Ameri, 700 m, *Guillaumin et Baumann 8895* (US).

**11. *Terminalia* L. (Combretaceae) in Eastern Polynesia**

***Terminalia* L.**

Six or seven species of *Terminalia* have been reported from eastern Polynesia, omitting obviously cultivated, non-naturalized species. Most have been at one time or another regarded as forms of the widespread *T. catappa* L., which is, in its typical, well-known form, present on most of the islands, probably as an aboriginal or recent introduction. The names, other than *T. catappa*, that have been used for eastern Polynesian plants are: *T. glabrata* Forster f., described from Tahiti

(and Tonga), mentioned from the Marquesas; *T. haroldii* Exell, described from the Austral Islands, Raivavae, Tubuai, and Rurutu; *T. koariki* Exell, described from the Gambier Islands (Mangareva); *T. microcarpa* Nadeaud, described from Moorea; *T. samoensis* Rechinger, described from Samoa and reported eastward to the Society Islands and Makatea; *Terminalia* sp. from Rarotonga (Wilder); and "*Terminalia catappa* . . . Indigenous form" from the Marquesas (Brown).

Represented among these are at least three clearly distinct types: *T. catappa*, with large bicarinate fruits; a very small-fruited type commonly known as *T. samoensis* including also the plant called *T. microcarpa* Nadeaud; and a group of apparently indigenous forms with medium-sized fruits, possibly related to *T. litoralis* of the Western Pacific, but perhaps closer to *T. catappa* L. These latter are here treated as varieties of a collective species, *T. glabrata* Forster f., originally described from the Society Islands (and Tonga).

In addition to the indigenous or probably indigenous species, *Terminalia bellirica* (Gaertner) Roxburgh, indigenous to Malesia, has been cultivated in Rarotonga, Averua, 20 June 1929, *Wilder 872* (BISH) (determined by A. C. Smith, 1970). In Tahiti and the Marquesas one or more other species are planted, but specimens suitable for identification are lacking.

**Key to Eastern Polynesian Taxa of the *Terminalia catappa* Group**

1. Fruit mostly over 5 cm long; fruit strongly bicarinate, leaves strongly contracted to subcordate at base, petiole thick, broader than thick . . . . . ***T. catappa***
1. Fruit usually less than 5 cm long . . . . . 2
  2. Fruit 2.5 cm or less long, pubescence dull to golden yellow, leaf-base various . . . . . ***T. samoensis***
  2. Fruit 2.5–5 cm long, pubescence rusty or brownish, rarely golden brown . . . . . 3
    3. Racemes glabrous or almost so, at least in distal half, leaves cuneate at base, to a relatively slender terete petiole . . . . . 4
      4. Basal half of rachis of raceme glabrous or almost so . . . . . ***T. glabrata* var. *glabrata***
      4. Basal half of rachis finely sericeous . . . . . ***T. glabrata* var. *rarotongensis***

3. Racemes pubescent ..... 5
  5. Fruit usually half as wide as long or narrower ..... *T. glabrata* var. *brownii*
5. Fruit generally more than half as wide as long ..... 6
  6. Fruit obovoid to obovoid-ellipsoid, not or scarcely beaked .... *T. glabrata* var. *haroldii*
  6. Fruit ovoid to ovoid-ellipsoid, often sharply beaked ..... *T. glabrata* var. *koariki*

### *Terminalia catappa* L.

*Terminalia catappa* L., Mantissa, 1:128, 1767.

This species is common as a planted or spontaneous tree in Tahiti, Raiatea, Makatea, Marquesas, and many other islands in Polynesia.

**SPECIMENS SEEN.**—COOK ISLANDS: Rarotonga I., Avarua, around buildings *Philipson 10334* (US). SOCIETY ISLANDS: Tahiti: 1 mi [1.6 km] NE of Papeete, 2 m, *MacDaniels 1698* (BISH); Papeete, *Grant 4312* (BISH). Raiatea, Uturoa, near beach, cultivated, *Moore 205* (BISH), "autaraa." Huahine, Fare, beach, *Grant 5247* (BISH, K), *5248* (BISH). Tetiaroa Atoll, Onetahi I., *Sachet 1669* (US), *1681* (US). Mopelia Atoll, planted in village, *Sachet 985* (US). MAKATEA ISLAND: village, cultivated, 25 ft [8 m], *Wilder 1160* (BISH), "autaraa autua." TUAMOTU ISLANDS: Anaa Atoll, *Brown 299* (BISH). Takapoto Atoll, seen in village, *Sachet* in 1974, "autara'a" (Tahitian name); Rangiroa, seen in Tiputa village, *Sachet* in 1963 "autara'a" (Tahitian name). MARQUESAS ISLANDS: 15–20 m common, *Herbier S.F.I.M. 50* (P) "maihii." Nukuhiva: Taiohae, 20 m, *Brown 626* (BISH); Taiohae Village, near sea level occasional occurrence in most villages, *Decker 2225* (US). Hivaoa: Atuona, near sea level, 5 Apr 1929, *PES (M & A) 193* (BISH, LeB), "taie"; near sea level, 2 Oct 1930, *PES Ex 193* (BISH); near sea level, 25 Apr 1929, *PES (M & A) 306* (BISH, LeB) "taie"; road to beach, 3 m, *Sachet 1861* (US, K). Fatuiva: 20 m, *Brown 940* (BISH, leaf only); Omo'a Valley, 50 m, *Decker 2646* (US); Omo'a near landing, 5 m, *Decker 2647* (US), "koai'i enata," *2648* (US). PITCAIRN ISLAND: Adamstown, in village, 70 m, *St. John 15033* (BISH) "mango"; *Fosberg 11256* (BISH).

### *Terminalia glabrata* Forster f.

*Terminalia glabrata* Forster f., Pl. Esc., 52, 1786; Prodr., 74, 1786.

*Terminalia glabra* Forster ex Cuzent, Tahiti, 232, 1860 (sphalm.)

This species was carefully described by Forster in *De Plantis Esculentis*, fortunately, since it seems

to have almost disappeared. At least it has apparently not been collected on Tahiti in this century, and only once in Raiatea.

Forster's description calls for a plant with glabrous peduncles, rufescent terete petioles and glabrous leaves. Such a plant was collected in Tahiti in 1856 by Nadeaud. There have been various references to the species, but apparently few collections, none at all recent excepting *Moore 390* collected in 1926. Forster records it from the Society and Tonga islands. A. C. Smith refers the Tonga record, probably correctly, to *T. litoralis* Seemann.

Two specimens ascribed to "Taïti" were collected by *Savatier* (P) and are similar but have the young growth and inflorescences densely pubescent, as in plants described, but not named, by Brown from the Marquesas. They probably came from the Marquesas. Plants, presumably of this relationship, have been described from Mangaeva (*T. koariki* Exell), the Austral Islands (*T. haroldii* Exell), the Cook Islands, Rarotonga (*T. species*, Wilder), and the Marquesas (*T. catappa*, indigenous form, Brown). These all seem related to *T. catappa* but to be somewhat distinct from it. The characters distinguishing them from each other are very tenuous, and we are regarding them all as varieties of *T. glabrata*.

This collective species may be briefly characterized as follows. Tree, often becoming very large; young bracts variously pubescent; leaves generally obovate, with base gradually narrowed to a usually short petiole, with no tendency to be subcordate; inflorescences axillary, unbranched, flowers white to pinkish, fragrant, distal flowers staminate, pedicellate, proximal flowers bisexual,



sessile; fruit 2.5–5 cm long, red, fleshy, usually not strongly bicarinate, ovoid to obovoid, somewhat compressed.

The varieties of *T. glabrata* are so variable as to be almost impossible to separate by a key, yet they seem to represent separate ranges of variation. They are, except perhaps for var. *brownii*, represented by too little material. When more collections of the others become available the differences either may be strengthened or may become altogether obscure.

### *Terminalia glabrata* Forster f. var. *glabrata*

Description extracted from Forster's very full account in *De Plantis Esculentis*..., 52–54, 1786 (tr. F.R.F.) follows.

Large tree, leaves glabrous, young growth rusty-sericeous glabrate, about 17 cm long, ovate to obovate, petiole shortly reddish pubescent, terete, about 2.5 cm long; racemes in axils of uppermost leaves, glabrous (usually almost imperceptibly puberulent or rarely sparsely sericeous toward base), "spithamei" [a span of about 17 cm long]; flowers white, perianth campanulate, 5-parted, lobes ovate, acute, erect, corolla none; nectary urceolate, in bottom of calyx, consisting of 5 small hard bodies, much hair half shorter than calyx; filaments 10, subulate, erect, inserted at bottom of calyx, the 5 outer ones as long as calyx, the inner shorter, anthers ovate, didymous, erect; hermaphrodite flowers numerous to middle of raceme, ovary inferior, sessile, ovate-oblong, thickened at base; drupe oval [almost terete], sessile, acuminate, apex withering green, nut oval, bony, with a single oblong white seed, a third the size of that of *T. catappa*.

The following notes were made from the Forster sheet in the British Museum, here designated as lectotype. Young growth rusty sericeous, leaves to 22 × 11 cm almost glabrous, thin, obovate, scarcely acuminate, cuneate at base into rather slender petioles 1–2 cm long, racemes slender, sparsely sericeous toward base, almost glabrous distally, sparsely flowered, flowers sparsely puber-

ulent without, calyx cup-shaped, choked within with dense brown hair (no fruit).

**SPECIMENS SEEN.**—s.l., *s. coll.* (P), "autara". SOCIETY ISLANDS: Tahiti: s.l., Forster (BM, lectotype); Capt. Cook (BM); *s. coll.* (K); Barclay s.n. (K); Hinds in 1841 (K); McCormish in 1934 (K); Hombron in 1838–1840 (P); [Pancher in 1861] (P); Vesco in 1847 (P); Moerenhout s.n. (P), "autara"; Pancher s.n. (P), "autara-tara-iri"; Taone and Otumaoro, Nadeaud, 10 Dec 1856 (P), "autaroa, taraire, aua." Raiatea: cultivated in small valley W of Averaiti, 15 m, Moore 390 (BISH), "aua tahiti."

### *Terminalia glabrata* var. *brownii* Fosberg & Sachet, new variety

*Terminalia catappa* L. "2. Indigenous form" F. Brown, Bishop Mus. Bull., 130:194, 1935

Arbor magna, partibus juvenalibus pubescentibus, foliis ellipticis vel obovatis basim cuneatis non auriculatis petiolatis, racemis pubescentibus, floribus albis fragrantis extus sparse pubescens, fructibus vix compressis anguste alatis vel vix angulatis maxime 5 × 3 × 2 cm valde variantibus. Type: Marquesas Islands, Hivaoa, Sachet 1309 (US, holotype; BISH, P, isotypes).

Large tree (one collection, Schäfer 5581, reported as 45–50 m tall, trunk over 2 m in diameter), young parts rusty or yellowish pubescent; leaves elliptic to more often obovate, to 24 × 15 cm, apex rounded to acuminate, base cuneate to somewhat attenuate to petiole, not at all auriculate nor even subcordate, veins pubescent beneath, petiole densely pubescent, 1–2.5 cm long; racemes (or spikes) 6–10, in fruit to 16 cm long, densely red-brown to yellowish pubescent on peduncle, rachis and bracts, less so distally, bracts shorter than buds, early caducous; flowers white to pinkish, fragrant, staminate flowers on distal ¾ of rachis, irregularly separated into pseudowhorls, pedicels about 2 mm long, thinly pubescent, perfect flowers on basal part of rachis, sessile, ovaries thinly pubescent; calyx of both types of flowers broadly cup-shaped, lobes triangular, very sparsely puberulent without, pilose within, stamens with anthers not or scarcely exerted, styles of perfect flowers scarcely more exerted; fruit broadly ellipsoid to ovoid or obovoid, 2.5–5(–6)

$\times 1.8\text{--}3 \times 1.5\text{--}2$  cm, flesh red to purple when ripe, narrowly winged, especially distally but wing becoming obscure or disappearing at maturity, obtuse to beaked, very variable in this respect, stone corky, seed edible.

This seems closest to var. *haroldii*, from the Austral Islands, the leaves less pubescent beneath on midrib, rachis of inflorescence more densely and longer pubescent, and the fruit longer and narrower, less carinate along the sides. It is also related to var. *koariki*, of the Gambier Islands, that has fruit flat on one side, more ochraceous pubescence, shorter petioles, wider fruits. It is found in Nukuhiva and the southern islands of the Marquesas Archipelago, mostly in the lowlands and around villages, except in Mohotani, where it occurs at higher elevations, from 300 to 450 m.

**SPECIMENS SEEN.**—MARQUESAS ISLANDS: Nukuhiva: reported by Jardin (1857:296, 310), who says: "29. *Terminalia glabrata*, Forst., maii, se trouve aux Marquises, dans toutes les koikas ou places publiques, comme les ifs dans nos cimetières. Les kanacs de cet archipel mangent quelquefois le fruit, qui a à peu près le goût de l'amande. Le bois est dur et rougeâtre, il pourrait être utilisé dans les constructions." "29. *Terminalia glabrata*, Forst.: maii. 70" [his coll. no.; probably this taxon]; Hakaui, 500 m, *Brown 445* (BISH); *Mercier 7* (P). Hivaoa: Atuona, small ravine at top of village, 20 m, *Sachet 1309* (US, holotype, BISH, P), "Koai'i"; one tree on river bank, *Sachet 1862* (US); Hanamenu, planté dans l'ancien village, 5 m, *Schäfer & Oliver 5251B* (US); Taaao, Upeke, enormous tree growing through old stonework, *Sachet 1945* (US); same tree, *Schäfer 5581* (US), "Koaiki." Tahuata, Vallée de Iva Iva, près de la mer, *Thibault 99* (US). Mohotani: central part of I., 380 m, *Decker 2809* (US); 300 m, *Schäfer 5685* (US); partie méridionale, 440 m, *Schäfer 5706* (US); tiers méridional, "plateaux," 450 m, *Schäfer 5948* (US), "koaiiki" (Hivaoa name). "Taïti": *Savatier 954* in 1877 (P); *Savatier*, 8 Sep 1877 (P), suspected to be from the Marquesas, see above.

***Terminalia glabrata* var. *haroldii* (Exell)  
Fosberg & Sachet, new combination**

*Terminalia haroldii* Exell, Occ. Pap. Bishop Mus., 11(22):3, 1936.

Tree to 20 m tall, twigs brownish or reddish brown sericeous, glabrate; leaves crowded toward apices of twigs, up to  $16 \times 9$  cm, obovate, obovate-

elliptic or rarely elliptic, above pilosulous on costa toward base, minutely pubescent beneath, veins 8–11 pairs; flowers white or pink in spikes 8–10 cm long, rachis tomentellous, staminate flowers distal, hermaphrodite proximal; calyx cup-shaped, 1 mm high, densely pilose outside below, disk 5-lobed, 1.2 mm across, filaments 1 mm long, style 1 mm long, fruit ellipsoid to obovoid-ellipsoid, lightly compressed, narrowly circumalate or costate,  $3.5\text{--}4 \times 2.5\text{--}2.8$  cm, glabrous. (Description extracted from that by Exell.)

**SPECIMENS SEEN.**—AUSTRAL ISLANDS: Tubuai, along road S of Mataura, thicket by roadside, 75 m, fl. and fr. August, *St. John 16206* (BISH, holotype; US, BM, K, isotypes). Rurutu, around houses, Moera, 3 m, *Fosberg 11955* (BISH, BM). Raivavae, open forest, west side of Vaianaua, 30 m, *Fosberg 11677* (BISH, BM).

***Terminalia glabrata* var. *koariki* (Exell)  
Fosberg & Sachet, new combination**

*Terminalia koariki* Exell, Occ. Pap. Bishop Mus., 11(22):3–4, 1936.

Tree to 20 m, twigs at first rufo-sericeous then cinnamon-brown pubescent; leaves crowded at apices of twigs, blade obovate to broadly obovate,  $9\text{--}26 \times 5.5\text{--}18$  cm, glabrous above except lower part of costa which is tomentellous, pubescent beneath, veins 10–14 pairs; flowers unavailable; fruit red, ovoid to ovoid-ellipsoid, slightly compressed, apex slightly acuminate, mostly narrowly circumalate or costate,  $3\text{--}4.5 \times 2\text{--}3.4$  cm, glabrous.

**SPECIMENS SEEN.**—TUAMOTU ISLANDS: Anaa Atoll: s.1., *Brown & Brown 299* (BISH), "kahaia"; Tukahora, 2 m, *St. John 14250* (BISH). GAMBIE ISLANDS: Mangareva, Akamaru, 80 m, *St. John 14716* (BISH, holotype; K, isotype). Taravai, in village by quay, NE end, 3 m, *St. John 14831* (BISH). Kamaka, 40 m, *St. John 14732* (BISH). Agakaitai, W side, near shore, 5 m, *St. John 14936* (BISH). Vernacular names: "koariki," "kouaiiki," "kovariki."

***Terminalia glabrata* var. *rarotongensis*  
Fosberg & Sachet, new variety**

*Terminalia catappa* sensu Cheeseman, Trans. Linn. Soc. Lond., II, Bot., 6(6):279, 1903 [non L., Mantissa, 1:128, 1767]. *Terminalia* species.—Wilder, Bishop Mus. Bull., 86:80, 1931.



Arbor folio basin versus cuneato, rachidi spicae basin versus sericea apice versus glabra, fructu crasse late ovate bicarinato obtuso maxime  $4 \times 3.5 \times 2$  cm. Type: Cook Islands, Rarotonga, *Sykes 1715/CI* (US, holotype; CHR, isotypes).

Tree to 18 m or more tall, with horizontal branching, semi-deciduous, young parts brown to golden-brown sericeous; leaves crowded at tips of branches, largely deciduous in winter, broadly obovate, to  $28 \times 13$  cm, mostly smaller, thin-coriaceous, glossy above, turning red in age, apex rounded to truncate, obtuse or very slightly acuminate, base cuneately narrowed to a petiole 10–15 mm long, 2–3 mm thick; spikes to 13 cm long, rachis hirtellous-sericeous in basal part, becoming less so distally, terminal part glabrous, flowers with ovaries golden-sericeous, calyx very broadly campanulate, almost glabrous without, lobes triangular, within choked with dense hair, stamens exerted from this, fruit plumply ovoid, to  $4 \times 3.5 \times 2$  cm, or mostly smaller, sharply bicarinate, apex rather obtuse to emarginate, base rounded, endocarp thick, corky, with 2 longitudinal furrows on each side.

This variety is found at lower elevations, to 500 m, in open forest or along roadsides or around buildings; possibly at one time it was cultivated. Wilder's statement, substantiated by the labels of his specimens, that this tree is common on the high mountains and on Maungatea at 1500 ft is not supported by the observations of recent collectors. Apparently it is endemic in Rarotonga.

**SPECIMENS SEEN.**—COOK ISLANDS: Rarotonga: s.l., *Parks & Parks 22337* (BISH, K); *Rice 530* (K); sea level, [Wilder] 20 Apr 1929 (BISH); 1000 ft [305 m] *Wilder 20* (K); Matavera, roadside, *Sykes 1715/CI* (US, holotype; CHR, isotypes); Maungatea, 1500 ft [460 m], *Wilder 870* (BISH), 871 (BISH), "kauarika"; Avarua, around building, *Philipson 10334* (CHR); Toikoitu Valley (Connel's Gulch), 400 ft [120 m], *Sykes 1992/CI* (CHR); Te Kaki Motu area, 500 ft [150 m], *Sykes 1395/CI* (CHR); central portion of island, *Cheeseman 530* (K), "kauariki"; 2 mi [3.2 km] inland, 400 ft [120 m], *McCormish* in 1934 (K).

### *Terminalia samoensis* Rechinger

*Terminalia samoensis* Rechinger, in Fedde, Repert. Sp. Nov., 4:229, 1907.—Smith, Brittonia, 23:410–411, 1971.

*Terminalia microcarpa* Nadeaud, Jour. de Bot. (Morot), 13(1): 1, 1899 [non Decaisne, Nouv. Ann. Mus. Paris, 3:457, 1834].

*Terminalia saffordii* Merrill, Phil. J. Sci. Bot., 9:19, 1914.

Shrub or small tree, young parts yellowish pubescent; leaves obovate, glabrous or subglabrous, coriaceous, obovate, usually rounded, obtuse or truncate at apex, base from cuneate to subcordate, petiole sub-terete, about 1 cm or rarely to 3 or even 4 cm long, pilose or pilosulous; spikes axillary, up to 13 cm long, spreading pilose or pilosulous, flowers glabrous without, cup-shaped, usually 5-lobed; fruit red, ovoid  $2.5 \times 1.5 \times 1$  cm or smaller, edges angled but becoming rounded at maturity, endocarp hard.

*Terminalia samoensis* seems generally distinct from *T. litoralis* Seemann of Fiji, by the somewhat smaller, less cylindric fruits and pubescent, usually considerably shorter, inflorescences. It may be absent from Fiji. At least A. C. Smith (1971: 411) regards all the Fiji specimens as *T. litoralis*. In Tonga, however, the distinction becomes tenuous, only the pubescent versus glabrous rachis being reliable. Its closest relationship is with *T. litoralis* (see Smith, 1971:411).

This is a widely distributed strand species, extending from Celebes, Mangsi, in the Sulu Sea, and New Ireland eastward to the Society Islands and Makatea, and northward to the southern Marianas, Marshall, and Phoenix islands.

Nadeaud cites "dans la portion nord du district de Haapiti" as the locality for his labelled *T. microcarpa*. His specimen of "Terminalia!" is labelled as from "Oporo Vainui," but it still may be the specimen referred to and hence part of the type.

**SPECIMENS SEEN.**—SOCIETY ISLANDS: Borabora, Tevaitapui, Motu Tevairoa, 3 ft [1 m], *Grant 4998* (BISH). Moorea, Oporo Vainui, *Nadeaud* in March 1898 (P, probably type of *T. microcarpa*). Tetiaroa Atoll, Onetahi Islet, *Fosberg & Sachet 54632* (US). Huahine: Fare, Aratupaupau, 5 ft [2 m], *Grant 5333* (BISH); Motu of Maeva, 1 m, *Baré 33* (US).

## 12. Further Notes on *Myrsine* L. (Myrsinaceae) in Eastern Polynesia

### *Myrsine gracilissima* Fosberg & Sachet

*Myrsine gracilissima* Fosberg & Sachet, Smithsonian Contr. Bot., 21:6-7, 1975.

The sheet cited below, not located at the time the description of this species was prepared, has larger leaves, up to  $6.5 \times 2$  cm, with subentire, irregularly undulate margins, and the punctation very obvious on the upper surfaces. The plant is indicated on the label as "1 m. high," so it must be from a sapling or sprout. It is said to be "common at high elevation." It is not at all the same as the Rarotonga specimen, *Wilder 774* (BISH, part), mentioned with the original description.

SPECIMEN SEEN.—MARQUESAS ISLANDS: Hivaoa, Atuona, 1000 m, *Pacific Entomological Survey Ex 148* (BISH).

### *Myrsine orohenensis* (Moore) Fosberg & Sachet

*Myrsine orohenensis* (Moore) Fosberg & Sachet, Smithsonian Contr. Bot., 21:9, 1975.

*Rapanea orohenensis* J. W. Moore, Occ. Pap. Bishop Mus., 16(1):16, 1940.

*Rapanea st.-johnii* Grant in Grant et al., Smithsonian Contr. Bot., 17:19, 1974.

*Myrsine st.-johnii* (Grant) Fosberg & Sachet, Smithsonian Contr. Bot., 21:10, 1975 [non Hosaka, Occ. Pap. Bishop Mus., 16(2):37-39, 1940].

Professor Robert L. Wilbur kindly drew our attention to the fact that *Myrsine st.-johnii* is a later homonym, for which we thank him. An opportunity to compare the type and other available material of *Rapanea st.-johnii* Grant with the type and only collection of *Rapanea orohenensis* was afforded by a visit to the B. P. Bishop Museum. It now seems obvious that these two species differ only in leaf size, *M. orohenensis* being at the small end of the range of variation. Four collections of this have become available which show a remarkable amount of variation in leaf size and a little variation in shape. Maintaining two species based principally on leaf size becomes untenable in light

of these collections, cited below. All are from the same area in the high mountains of Tahiti.

SPECIMENS SEEN.—SOCIETY ISLANDS: Tahiti: Orofena, 1600 m, *St. John & Fosberg 16989* (BISH, holotype of *Rapanea st.-johnii*), 17019 (BISH); top of ridge S of Orofena, 1650 m, *MacDaniels 1326* (BISH, isotype of *R. orohenensis*), 1477 (BISH).

## 13. New *Geniostoma* J. R. & G. Forster (Loganiaceae) Taxa

Since our treatment of eastern Polynesian *Geniostoma* (Fosberg and Sachet, 1975: 11-14), collecting in poorly known areas has yielded three new species and two new varieties in this genus. They are from the Marquesas and Cook island groups. All would fall within the broad circumscription of *Geniostoma rupestre* Forster adopted by Leenhouts (1962), but this concept seems to us to obscure understanding of the insular evolution shown by this plastic genus.

### *Geniostoma gagneae* Fosberg & Sachet, new species

Frutex glaber internodiis 0.5-4 cm, foliis late ellipticis petiolis 1-1.5 mm longis, cymis valde reductis, pedicellis 2 mm longis bracteatis, corolla 2.5-3.5 mm longa, lobis 1.5-2.5 mm longis ciliolatis intus mediam hirtellis, fauce dense longepilosa. Type: Marquesas Islands, Fatuiva, *Gagné 1239* (BISH, holotype; US, isotype).

Shrub 1-1.5 m tall, stems glabrous, internodes up to 4 cm long, or much shorter, with 4 costae only when very young, leaves broadly elliptic, firm-chartaceous to subcoriaceous up to  $7 \times 4.5$  cm, apex obtuse to very slightly acuminate, obtuse to rounded or slightly subcordate, veins 7-8 pairs, subopposite, prominent beneath, glabrate, petiole about 1-1.5 mm long and 2-2.5 mm wide; stipules reduced to a very narrow collar, almost obsolete; inflorescence a condensed cyme of 3 triads or reduced to a fascicle of 4-6 flowers or to a single triad, or even a single flower, pedicel about 2 mm long, with usually one or two ovate scale-like ciliolate bracts part-way up, sepals ovate, acutish, ciliolate, corolla 2.5-3.5 mm long,



funnel-form-campanulate to subrotate, tube 1–1.5 mm long, lobes ovate, with thin ciliolate margins, margins glabrous within, central parts densely hirtellous, throat long-pilose, filaments 0.5 mm wide, apex and bases of cells rounded, style glabrous, about 1.5 mm long, stigma compressed globose or slightly grooved on sides, twice as wide as long, puberulent.

Distinctive as species go in this genus, *Geniostoma gagneae* is set apart from *G. hallei* by its small broad leaves, short petioles, and very much reduced inflorescences. This new species is named for Mrs. Betsy H. Gagné, whose 1977 collections provide a substantial addition to recorded knowledge of the Marquesan and Society Island floras. It is endemic to Fatuiva Island, Marquesas, where it is apparently very rare on high ridges.

**SPECIMENS SEEN.**—MARQUESAS ISLANDS: Fatuiva: at base of Mt. Natahu, 670 m, *Gagné 1239* (BISH, holotype; US, isotype); 781 m, *S. L. Montgomery (B. H. Gagné's) 1267* (BISH, US).

***Geniostoma hallei* var. *fatuiense***

Fosberg & Sachet, new variety

Frutex glaber, foliis maxime  $9.5 \times 5$  cm, oblongo-ellipticis vel ovatis, petiolis 7–14 mm, cymis laxis maxime 2.5 cm, nodis 2–3, stigmatibus 2, libris vel connatis. Type: Marquesas Islands, Fatuiva, *Gagné 1247* (BISH, holotype; US, isotype).

Low bushy shrubs, stems glabrous, internodes terete even when very young, 1.5–4.5 cm long, nodose, leaves oblong-elliptic to ovate, glabrous, up to  $9.5 \times 5$  cm, obtuse to acutish or slightly acuminate at apex, acute to obtuse at base, 8 main veins on a side, petiole 7–14 mm long; stipular collar 1–2 mm high; cymes loose, to 2.5 cm long, main axis of 2–3 internodes plus terminal pedicel, lowest node without ramification or with one pair of flowers, rarely with 2 dichasia, rarely a single extra pedicel below the dichasium, second node with one pair of flowers, or, if two internodes only, with a terminal dichasium, pedicels about 5 mm long, with 2–3 bracts, rarely none; stigma either of 2 globose lobes or these united into a double head, puberulent.

This variety is rare, growing on cliffs, and is endemic to Fatuiva, Marquesas. It approaches *Geniostoma gagneae*, but its petioles are those of *G. hallei* and even longer, its inflorescences also are even more open than those of *G. hallei*.

**SPECIMENS SEEN.**—MARQUESAS ISLANDS: Fatuiva, Teavapuhiau Pass (above Ouia Valley), 785 m, *Gagné 1247* (BISH, holotype; US, isotype).

***Geniostoma hallei* var. *hivaoense***

Fosberg & Sachet, new variety

Foliis parvis ellipticis, cymis 5(–3)-floribus reductis a var. *hallei* differt. Type: Marquesas, Hivaoa, *Gagné 1215* (US, holotype; BISH, isotype).

Shrub 1–1.5 m, glabrous, internodes to 3.5 cm; leaves elliptic to ovate or broadly ovate, base acute to rounded, to  $7 \times 3$  (–4) cm, firm chartaceous, acute to slightly acuminate, petiole 5 mm long; cymes 1–1.5 cm long, with usually 2 nodes, the lower with a pair of flowers, the upper with a triad, or reduced to a pedunculate triad.

Rare, on steep windward cliffs on Hivaoa I., Marquesas. Differs especially in the smaller, more elliptic leaves and the lower triads of the cymes reduced to single flowers.

**SPECIMENS SEEN.**—MARQUESAS ISLANDS: Hivaoa I.: Mt. Ootua, 860 m, *Gagné 1215* (US, holotype; BISH, isotype); sentier d'Atuona à la crête de Feani, haute vallée, côté Atuona, 980 m, *Schäfer 5942* (MPU, US) [this specimen differs in having broader, more ovate, thinner, slightly more acuminate leaves, more open inflorescences, the uppermost ones triflorous].

The sterile specimen from Hivaoa, *Brown 1096* (BISH), cited with the original publication of *Geniostoma hallei*, probably belongs here.

***Geniostoma sykesii* Fosberg & Sachet,**

new species

Frutex vel arbuscula glaber vel vix puberulus internodiis vix quadrangularibus nodosis, foliis oblongis, ellipticis ovatis apice obtuso vel rotundato, nervis utroque costae latere 5–7, cymis 2–3-trichotomis vel infra pentachotomis bracteatis, calyce valde anguste lobato, lobis carinatis, corolla alba, tubo brevi, lobis ovatis, stylo 1–1.5 mm,

fructo 8 mm longo. Type: Cook Islands, Mitiaro, Ramsay in 1965 (CHR, holotype).

Shrub or small tree, glabrous or rarely (1094/CI) slightly puberulent, twigs somewhat but not strongly puberulent, internodes (0.3–)1–4(–5.5) cm long, nodes rather prominent; leaves oblong to elliptic or rarely somewhat ovate, up to 9 × 4.5 cm, usually smaller, thin, venation rather obscure (except in 671/CI, from Mangaia), main veins 5–7 on a side, subopposite to alternate, apex obtuse to rounded, petiole 2–6(–10) mm, rather slender, slightly puberulent; stipular collar thin, sides very low, rounded; inflorescences in middle leaf-axils, rarely (1017/CI) also on nodes below leaves, up to 15 mm long, glabrous, twice or usually thrice trichotomous or at lower nodes pentachotomous, bracts ovate to ovate-lanceolate, subacuminate, carinate, margins and apical parts strongly papillate-puberulent; outer flowers in dichasium immediately subtended by one or more bracts, and outer pedicels may have one or two bracts part way up; calyx lobes erect, separated nearly to base, narrowly triangular, strongly carinate, slightly acuminate, margins and apices strongly papillate-puberulent; corolla white, tube short, glabrous without, included in calyx or somewhat exserted, lobes ovate, deeply separated, usually somewhat clawed (or claws united into a tube in 1017 b/CI) with 3 dark veins (when dry) the outer ones forked, papillate without, especially toward apex, strongly so within, apices acutish; anthers ovate-triangular, sagittate at base, 0.8–1 mm long, style distinct, sharply set off from ovary, 1–1.5 mm long, slender, stigma cylindric-capitate, 0.5 mm long; fruit valves oblong 8 × 4 mm (469/CI).

This species, endemic to Mitiaro and probably Mangaia, Cook Islands, is closely related to *G. quadrangulare* of Rapa, differing in the less quadrangular stems, longer internodes, shorter petioles, more leaf veins, smaller, less thyrsoïd and more compound dichasioid cymes, more deeply lobed calyx and corolla, and longer fruit. It is named from Mr. W. R. Sykes, who kindly made available the specimens on which it is based.

**SPECIMENS SEEN.**—COOK ISLANDS: Mitiaro: Sykes 469/CI (CHR); *G. W. Ramsay* in 1965 (CHR, type, 4 sheets); volcanic area near centre of island, Sykes 1094/CI (US);

makatea forest, Sykes 1057/CI (US), 1017 b/CI (US) [a very condensed specimen with internodes 2–7 mm long].

A specimen from Mangaia (Cook Islands), Sykes 671/CI (CHR) may belong here. It has very slender lateral branches, more prominent venation and a shorter style, but the specimen is inadequate.

***Geniostoma rarotongensis* Fosberg & Sachet,  
new species**

Arbuscula ramulis subteretibus glabris, foliis ellipticis glabris, petiolis gracilibus 8–16 mm, cymis 2-trichotomis, calyce lobis deltoideis, corollae tubo incluso, lobis lato-ovatis extus glabris intus dense papillato-puberulentis basi faucibusque valde pilosis; fructus desunt. Type: Cook Is., Rarotonga, Sykes 1920/CI (US, holotype).

Large shrub or small tree, to 7 m tall, twigs slender, not or scarcely quadrangular, internodes 1–3 cm long; vegetative parts glabrous; leaves elliptic, at most 10 × 4 cm, usually 7–8 × 2.5–3 cm, thin, glossy above, light green, acuminate at apex, acute at base, main veins not very prominent, 5–8 on a side, subopposite to alternate, arching toward margin, anastomosing and disappearing into an obscure network, petiole slender, 8–16 mm long; stipular collar low-triangular between petioles, soon splitting and disintegrating; inflorescences, 10–14 mm long, puberulent, axillary or at nodes below leaves, 1 or rarely 3 in an axil, twice trichotomous, rarely an extra pedicel outside each branch of the lower trichotomy, each lateral branch subtended by a triangular somewhat compressed or carinate bract, each branch ending in a triad or dichasium of pedicellate flowers, each lateral pedicel subtended by a bract, each flower subtended by a pair of bractlets; sepals broadly triangular, tending to be slightly acuminate, puberulent, ciliolate, corolla white or greenish, with tube short, included in calyx, lobes very broadly ovate, obtuse, glabrous without, with 3 broken slightly branched dark veins without (when dry), ciliate, distal part within minutely but densely papillate-puberulent, basal part and throat conspicuously pilose; stigma large, globose, densely puberulent, subsessile; fruit unavailable.



**SPECIMENS SEEN.**—COOK ISLANDS: Rarotonga: in low forest or in open on ridge tops, around Te Rua Manga (Needle), ca. 1100 ft [335 m], *Sykes 1920/CI* (US, holotype); Te Manga, 1750 ft [535 m], *Sykes 2046/CI* (US); Ikurangi, ca. 1500 ft [455 m], *Sykes 1948/CI* (CHR).

The plant doubtfully referred by Cheeseman (1903:288) to *G. rupestre* must be this species. It seems closest to *G. astylum* A. Gray of Tahiti, rather than to *G. quadrangulare* as we suggested previously (Fosberg and Sachet, 1975:11–12). It differs in its much simpler, more puberulent inflorescence and more pubescent corolla throat.

#### 14. A New *Rauvolfia* L. (Apocynaceae) from the Marquesas<sup>3</sup>

The discovery of a *Rauvolfia* in the Marquesas extends the distribution of this genus in the Pacific from New Caledonia, the Carolines, and Hawaii to eastern Polynesia.

#### *Rauvolfia sachetiae* Fosberg, new species

FIGURES 3–5

Arbor parva lactifera; foliis ellipticis 3–4 verticillatis petiolatis, axillis glandulosis glandibus elongatis; cymis terminalibus axillarescentibus triplo vel sexies dichotomis, floribus terminalibus pedicellatis plerumque caducis; tubo corollae intus vix piloso, lobis ovatis obtusis 2.5 mm longis; fructu, subgloboso vel globoso, pyrena una compressa asymmetro-oblonga rugosa. Type: Marquesas Islands, Hivaoa, *Sachet 2115* (US, holotype; BISH, isotype).

Tree 6 m tall, trunk 25 cm diameter at base, branching somewhat horizontally, twigs and leaves in whorls of 3–4, whole plant glabrous, latex abundant (less so in March), bark light colored, basal internodes on twigs elongate, to 9 cm, rapidly becoming shorter distally to 1 cm or even 0.5 cm toward end of season's growth, terminal buds abundantly gummy; leaves elliptic or broadly elliptic, to 16 × 8 cm, mostly smaller but about half as wide as long or even wider, apex obtuse to acutish, base obtuse to acutish but

slightly decurrent on petiole, color light to bright yellowish green, even when dried, veins forming a wide angle with midrib, not conspicuous above, more pronounced beneath, mostly 12–15 on a side with weaker ones between main ones, forming a weak undulating intra-marginal vein, network irregular, not strong, petioles mostly 1.5–3 cm long; small, elongate, gum-secreting glands in leaf axils, these slender, tapering, about 1 mm long, scarcely stalked; cymes 3–4, terminal, becoming axillary, 3–5.5 cm long, peduncles 1.5–3 cm long, 3–6 times ramified, branching open, not congested, branches widely divergent, apparently trichotomous with central branch usually represented by a pedicellate flower, these early caducous at all but ultimate ramifications, a scale-like ovate-triangular bract subtending each lateral branch, a pair subtending each lateral bud, axils of bracts glandular as those of leaves, pedicel of central flower 2–2.5 mm long, lateral buds of a triad subsessile, globose, tending to develop into a new triad with only the central flower of a triad developing and reaching anthesis; flowers with calyx turbinate-campanulate, lobed almost to base, lobes about 1 mm long, imbricate, obtuse, margins thin slightly erose; corolla about 12.5 mm long including limb of unopened bud (open flowers unavailable), tube 9.5–14 mm long, 1.1 mm thick in middle, slightly dilated at top and bottom, lobes sinistrorsely imbricate, only very slightly contorted, ovate, rounded at apex, about 2.5 mm long; anthers narrowly ovate, somewhat bluntly acuminate, sagittate at base with somewhat rounded lobes, subsessile, 1.5 mm long, inserted 1.5 mm below throat, a very few hairs around and below insertion on inside surface of corolla tube; disk firm, cup-like, margin minutely crenulate, surrounding, but free from, ovary; style glabrous, to 7 mm long, stigmas thickened, joined on inner sides well below apices, leaving the apical parts free, lobe-like; ovaries oblong, 2, free about half-way down, more or less united in lower part; ovules collateral, 2 in a cell, attachment to a fleshy ventral placenta, well down from apex of placenta; fruit subglobose to globose, about 13–15 mm long, fleshy, turning black at maturity (at least when dry), not at all didymous, compressed,

<sup>3</sup> Fosberg sole author of study 14.



FIGURE 3.—*Rauwolfia sachetiae* Fosberg: *a*, habit (*Sachet with Decker 1885*)  $\times \frac{1}{2}$ ; *b*, inflorescence  $\times 1$ ; *c*, young fruit  $\times 1$ ; *d*, flower bud  $\times 2.5$ . (Drawn by Christopher H. Reinecke.)

or emarginate, subtended by persistent spreading calyx; stone 1 by abortion (in only mature fruit examined)  $12 \times 8 \times 5$  mm, compressed, obliquely oblong-ovoid, with one straight and one curved edge, base sub-truncate, apex diagonal from straight edge upward to a blunt point, sides coarsely and shallowly rugose.

*Rauwolfia sachetiae* differs from *R. sandwicensis* A. de Candolle (sensu lato) to which it is closely related, in its mostly broader leaves, 3–4 rather than 5 in a whorl, somewhat thicker petioles, more widely spaced veins, differently shaped and less conspicuously stalked axillary glands, much more gummy terminal buds, in the nature of the





FIGURE 4.—Only tree known of *Rauwolfia sachetae*, inflorescence, and young fruit. (Photos by Marie-Hélène Sachet.)

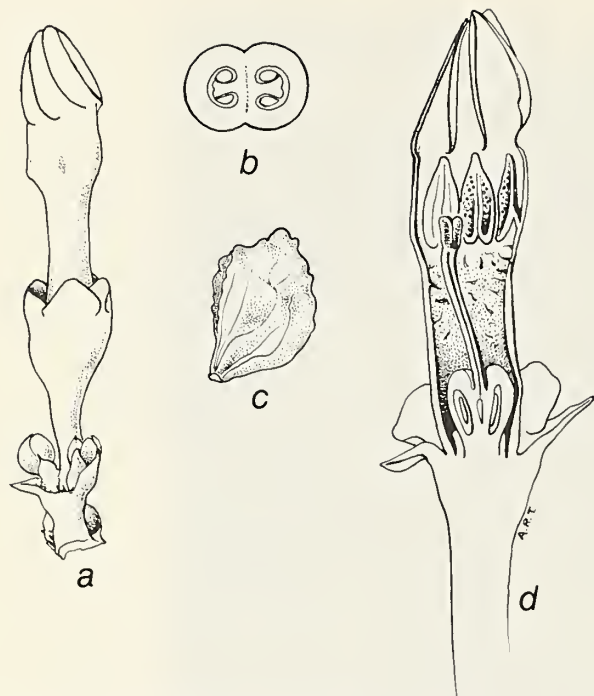


FIGURE 5.—*Rauwolfia sachetiae* Fosberg: *a*, bud  $\times 4.5$ ; *b*, cross-section of ovary  $\times 10$ ; *c*, pyrene of fruit  $\times 1.6$ ; *d*, longitudinal section of bud  $\times 6$ . (Drawn by Alice R. Tangerini from dissections and sketches by Dulcie A. Powell.)

ultimate divisions of the inflorescence branches, in the fruit not at all geminate, compressed, or emarginate; corolla tube much more locally and sparsely pilose within.

The most unusual feature of this species is the form and apparent behavior of the ultimate divisions of the inflorescence, which seem at first sight to be triads of flowers with the central flower pedicellate and most advanced, the lateral ones sessile and much younger, represented by globose buds subtended by a pair of scale-like bracts each, the triad, itself, subtended also by a pair of such

bracts. The developed central flower has no pair of bracts of its own. A search for triads with the lateral flowers developed yielded none even partially developed. Triads with the central flower past anthesis, or with it and its pedicel caducous, have either rudimentary or developing triads with developing central pedicellate flowers of their own. The inflorescence is built on a plan of repeated trichotomies with the central branch represented by a pedicellate flower which either forms a fruit or drops off. There apparently are no lateral flowers.

In most other species of the genus examined the ultimate cyme branches end in irregularly umbelloid clusters of pedicellate flowers which mature at different times. The cymes of *R. sandwicensis* are so congested that the ultimate branching habit is quite obscure, at least on herbarium specimens.

**SPECIMENS SEEN.**—MARQUESAS ISLANDS: Hivaoa, dry crest above Taaoa, SW of village, single tree in head of ravine in secondary scrub forest, 350 m, *Sachet 2115* (US, holotype; BISH, isotype), *Sachet with Decker 1885* (US, BISH, P), *Schäfer & Oliver 5293* (US, BISH, P, MPU) [all collected from same tree].

### 15. *Leucas* R. Brown (Lamiaceae) in the Pacific Islands

*Leucas* [Burman] R. Brown, Prodr., 504–505, 1810.

*Leucas* Burman, Thes. Zeyl., 140, 1737.

A large pantropical genus, of which three species are known from the Pacific islands. One of these, *L. decemdentata* (Willdenow) J. E. Smith, is certainly native at least in western Polynesia. It is uncertain how far east the other two were originally found in the Pacific. Their present limits, as known to us, are given below.

#### Key to Pacific Islands Species of *Leucas*

1. Leaves ovate, notably crenate, inflorescence bracts usually much shorter than calyx, obovate if well developed; calyx symmetric, teeth not strongly cuspidate ..... *L. decemdentata*
1. Leaves lanceolate or ovate-lanceolate to broadly linear, inflorescence bracts linear, calyx teeth strongly cuspidate ..... 2
2. Bracts notably long-hispid-hirsute, calyx glabrous below, somewhat asymmetric ..... *L. zeylanica*



## 2. Bracts densely hispidulous, calyx tomentose, strongly asymmetric .....

*L. linifolia**Leucas decemdentata* (Willdenow) J. E. Smith

*Leucas decemdentata* (Willdenow) J. E. Smith in Rees, Cyclopaedia, 20: LEU, 1812.—Drake, Ill. Fl. Ins. Mar. Pac., 263, 1890.

*Stachys decemdentata* Solander ex Forster f., Prodr., 91, 1786 [nomen nudum].

*Phlomis decemdentata* Willdenow, Sp. Pl., 3:124, 1800.

*Leucas flaccida* R. Brown, Prodr., 504–505, 1810.—Christophersen, Bish. Mus. Bull., 154:39, 1938.

*Leucas stachyoides* Sprengel, Syst., 2:743, 1825.

This widespread Polynesian species has, by recent authors, e.g., Christophersen, been called *L. flaccida* R. Brown, under the impression that Brown's epithet has priority, doubtless because most Pacific authors have failed to include Willdenow as parenthetical author. *Phlomis decemdentata* Willdenow was clearly cited by Smith in the synonymy of his *Leucas decemdentata*. Furthermore, it is probable, but not certain, that both names were based on the Banks and Solander collection cited below. Brown definitely refers to a Banks collection, but it may have been from Australia (his symbol T) rather than Tahiti or Raiatea (Ulhitea) where Banks had his artist, Parkinson, make an excellent drawing of it.

We know the species from specimens or reliable records from the Society Islands (Meetia, Tahiti, Moorea, Raiatea, Huahine, and Borabora); the Austral Islands (Raivavae); Samoa (Savaii, Upolu, and Tau); Cook Islands (Rarotonga); Tonga (Eu'a, Vava'u, and Nomuka); and Fiji (Viti Levu, Vanua Levu, and Ngau). Drake (1890:263) and others refer to it from "Iles Marquises: Malden (Macrae)." We have not seen it from the Marquesas and it seems rather unlikely that it grew on Malden, a dry low coral island. We have not looked up the Macrae collection, which may be in either Kew or the British Museum. Drake obviously thought, incorrectly, that Malden Island was in the Marquesas. He also reported this species from Timor, but did not cite a specimen. This record may well refer to one of the known Malesian species. However, material

from New Guinea, *Brass* 28094, 29325 (both US), determined as *Leucas javanica* Benthams, seems to belong here, so a Timor occurrence is not impossible.

The impression, originally shared by us, that *L. decemdentata* may not be native in eastern Polynesia, based on its sometimes weedy occurrence, seems less likely, since it was collected on Captain Cook's first visit to the Society Islands. Vernacular names in the Society Islands are variants of *Niuroaiti*.

POLYNESIAN SPECIMENS SEEN.—SOCIETY ISLANDS: Tahiti: *Banks & Solander* (P, US); *Savatier* in 1877 (P); *Nadeaud* in 1856 (P); 200 m, *St. John* 14228 (BISH); Meetia, 375 m, *Gagné* 1616 (BISH); Huahine, Maeva Motu, 1 m, *Baré* 78 (US). Borabora, Mt. Pahio, 150 m, *Fosberg* 12153 (BISH). AUSTRAL ISLANDS: Raivavae, Mt. Muatapu, 180 m, *Fosberg* 11772 (US). SAMOA: s.l., *U.S. Expl. Exped.* (US). TONGA ISLANDS: Eua, Ohonua, *Yunker* 15611 (US); Liku terraces, *Parks* 16395 (US). Vava'u, Leimatua, 150 m, *Yunker* 16062 (US). Nomuka, central lake, *Yunker* 15841 (US). FIJI ISLANDS: Viti Levu, Mba, vicinity Nalotawa, 550–600 m, *A. C. Smith* 4473 (US). Vanua Levu, Valanga Range, 200–400 m, *A. C. Smith* 389 (US). Ngau (Island), shore of Herald Bay, sea level, *A. C. Smith* 7930 (US).

*Leucas linifolia* (Roth) Sprengel

*Leucas linifolia* (Roth) Sprengel, Syst. Veg. ed. 15, 2:743, 1825.—Benthams, Labiatarum, 617, 1834; 744, 1835.

*Phlomis linifolia* Roth, Nov. Pl. Sp. Ind. Or., 260–261, 1821.

*Leucas lavandulaefolia* sensu auct. plur. [non J. E. Smith in Rees, Cyclopaedia, 20: LEU, 1812].

This widespread south and east Asiatic and Malesian species has generally been known as *Leucas lavandulaefolia* J. E. Smith. However, in his original publication of this name, Smith cited *Leonurus indicus* L. as a synonym, rendering *Leucas lavandulaefolia* superfluous and illegitimate, typified by *Leonurus indicus* L. (ICBN Art 7.11). *Leonurus indicus* cannot be transferred to *Leucas* because of *Leucas indica* R. Brown ex Sprengel, based on *Phlomis indicus* L.

In 1942 it was collected in Fiji, Viti Levu, by Greenwood 916, not seen by us but so determined

by A. C. Smith. It was again collected in 1970 in Fiji by *J. W. Parham 17325* (US) in Nadroga-Navusa, Cuvu Sand Hills. It was found in the Palau Islands, Babeldaob, in 1969 by *Carl Salsedo 164* (US), the first record from Micronesia.

***Leucas zeylanica* (L.) J. E. Smith**

*Leucas zeylanica* (L.) J. E. Smith in Rees, Cyclopaedia, 20: LEU, 1812.

*Phlomis zeylanica* L., Sp. Pl., 586, 1753.

This species has previously been known only as far east as the Malay Archipelago and the Philippines. It was collected in the Marquesas in 1838–1840 in “Nuhiva-Archipel des Marquises,” by *Hombron* (P) on the voyage of the *Astrolabe* and *Zélée*. We have not seen other specimens of it from there. It may have been an early accidental introduction which has not persisted. There is, of course, the possibility of a confusion of labels.

**16. Observations on *Cyrtandra* J. R. & G. Forster (Gesneriaceae) in the Marquesas Islands**

In spite of the detailed monograph of South Pacific *Cyrtandra* by the late George W. Gillett (1973), study of recent collections from the Marquesas has yielded a number of new taxa and a

reinterpretation of one of the most remarkable already known ones, *Cyrtandra jonesii* (F. Brown) Gillett. A new key to the known Marquesan taxa of *Cyrtandra* is presented.

***Cyrtandra* J. R. & G. Forster**

*Cyrtandra* J. R. & G. Forster, Char. Gen., 5–6, Tab. 3, 1776.

*Cyrtandroidea* F. Brown, Bishop Mus. Bull., 130:323, 1935.

Herbs or usually shrubs, rarely small trees or vinelike, often notably pubescent, stems and petioles with a tendency toward fleshiness; leaves generally opposite, simple; inflorescences cymose, usually bracteate, axillary or on old wood or even on roots; flowers usually bisexual; calyx enclosing bud, variously lobed or cut, lobes valvate, sometimes spathe-like; corolla usually zygomorphic, 5-lobed and bilabiate, lower lobe generally larger, rarely almost symmetrical, usually white, often thinly fleshy, lobes usually imbricate; stamens usually 2, rarely 4, 5, or 6, often with 1–3 reduced ones or staminodes in addition, filaments inserted on or adnate to corolla tube well below sinuses; ovary subtended by a disk-like nectary, 1- or rarely 2-loculed, placenta 5-parietal or rarely axile, fleshy, ovules many, style one, stigma bilobed or rarely capitate; fruit a soft berry, white or copper-colored to variously greenish, pink or even red; seeds small, many.

**Key to Marquesan *Cyrtandra* Taxa**

1. Calyx divided nearly to base, cymes usually longer than petioles ..... 2
2. Vegetative parts and cymes glabrous ..... ***C. feaniana***
2. Stems, petioles, and cymes pubescent ..... 3
3. Whole plant densely brownish pilose, peduncles stoutish ..... ***C. tahuatensis***
3. Plant mostly pubescent but not uniformly densely pilose (*Cyrtandra ootensis*) ..... 4
4. Cymes appressed-pilose ..... 5
5. Leaves almost glabrous above (except midrib when young), sparsely pilose beneath, more so on veins ..... ***C. ootensis* var. *ootensis***
5. Leaves appressed pilose above, soft velutinous beneath, feeling notably soft ..... ***C. ootensis* var. *mollissima***
4. Cymes pilose but hairs not appressed ..... 6



- 6. Corolla and fruit densely pilose . *C. ootensis* var. *fatuhivensis*
- 6. Corolla thinly woolly, fruit glabrate . *C. ootensis* var. *quaylei*
- 1. Calyx divided less than  $\frac{3}{4}$  the way to base, cymes various ..... 7
- 7. Leaves coriaceous with very short petioles, 1 cm or less long ..... 8
- 8. Leaves flat, orbicular ..... *C. toviaia*
- 8. Leaves strongly revolute, broadly elliptic ..... *C. revoluta*
- 7. Leaves usually thinner, if thick then large and brittle ..... 9
- 9. Cymes 1–3 cm long ..... *C. nukuhivensis*
- 9. Cymes (5–)10–30 cm long ..... 10
- 10. Plant notably appressed pubescent, inflorescences slender, not at all racemoid ..... *C. thibaultii*
- 10. Plant with leaves only thinly pubescent beneath, inflorescence thickish, racemoid, borne on stem well below leaves . *C. jonesii*

### *Cyrtandra jonesii* (F. Brown) Gillett

*Cyrtandra jonesii* (F. Brown) Gillett, Univ. Calif. Pub. Bot., 66:55, 1973.

*Cyrtandroidea jonesii* F. Brown, Bishop Mus. Bull., 130:324–325, 1935.

This species was described by Brown as the basis of a new genus, *Cyrtandroidea*, which he placed in the Campanulaceae. This genus was transferred by Burt (1968:217–218) to the Gesneriaceae and the species was transferred by Gillett to *Cyrtandra*. We completely concur with both of these dispositions.

Further study of the original material of *Cyrtandra jonesii* (F. Brown) Gillett and of subsequent collections referred to this species suggests that two species are involved.

Brown's description of *Cyrtandroidea jonesii* was based on two fragmentary collections, a flowering specimen from Uahuka (*Jones 1712* (BISH)) designated as lectotype by Gillett (1973:57), with concurrence by St. John (1976:422), and a fruiting specimen from the Toovii, Nukuhiva (*Quayle 1243* (BISH)). It is hard to sort out what of the vegetative part of Brown's description is from which specimen except by reference to the specimens. His flowering data came definitely from the Jones collection. The Jones collection is now represented only by leaves and detached inflorescences. Brown obviously dissected the flower and it does not now accompany the specimen. Hence what we know of it is only what Brown

says. His observations may well have been influenced by his idea that he was dealing with a member of the Campanulaceae.

The two collections available to Brown do not look especially alike. There is an enormous discrepancy in the size of the leaves, and the inflorescences were said to have been borne directly on large branches, i.e., cauliflorous, in the Jones specimen from Uahuka. This also has the under surface of the leaves very thinly pubescent, rather glabrate, the margins irregularly dentate or serrate.

Fortunately several subsequent collections have been made of the Nukuhiva plant, which has much smaller leaves notably villous beneath, subserrate, the cymes borne among the leaves. The floral details are different, also, from those described by Brown.

There appear to be two related species, each confined to a single island. Gillett's description was probably prepared mostly, if not entirely, from his own 2156, an ample collection from Nukuhiva in the same area as the Quayle material, which is similar; hence it applies to the Nukuhiva species if, as we have concluded, two species are included in *C. jonesii*.

The following description of *Cyrtandra jonesii* sensu stricto is compiled from our notes on the vegetative and inflorescence features of the Jones collection (Uahuka) and from Brown's description of its flowers. It is very inadequate, but

cannot be augmented until the plant is recollected.

Tree 4–6 m tall; leaves up to  $40 \times 25$  cm, base broadly acute, margin irregularly dentate, blade thick, brittle, somewhat pubescent beneath especially on veins, glabrate, petiole thick, short, 2.5 cm on smaller leaf; inflorescences said by the collector to sprout directly from larger branches, specimen shows 2 detached cyme branches (“floriferous shoots racemoid”) 10–20 cm long, their nodes with amplexicaul bract scars and large, very prominent, roughly circular pedicel scars, “shoots . . . simple or bifurcate, according to collector”; internodes 10–12 mm long, 3–4 mm thick, pubescent when young, glabrate; bracts orbicular-ovate, about 2 cm long, caducous, clasping at base, puberulent; “flowers sessile or shortly pedicellate, odorless, in dry specimens persistent only at the tip of the floriferous shoot; calyx campanulate, 30–35+ mm long, 15+ mm wide in dry compressed specimens, puberulent on the outer surface, brown when dry, the 5 lobes unequal, triangular acute, 7–14+ mm in length from the base of the sinus; corolla funnel-shaped, up to 5+ cm long, the 5 lobes oblong, obtuse, unequal, 15–20 mm in length, the dorsal slit not extending beyond the middle, the inner and outer surface more or less pubescent, and the tube with a row of glands at the base and, according to the collector, containing ‘about a teaspoonful of colorless viscous liquid in appearance like glycerine’; stamens 5, the filaments flattened and united into a glabrous tube 22+ mm long and up to 4+ mm in width (when compressed), the anthers oblong acute,  $5 \pm$  mm in length, glabrous, not penicillate, free (at least in dry specimens); mature style projecting  $7 \pm$  mm beyond the anthers, curved, conspicuously hairy outside, the 2 stigmatic lobes 2+ mm long, puberulent on the outer surface; ovulary superior or nearly so, conical, 2–3+ mm in length, glabrous, 2-locular, the outer walls rather thin, the central axis of the septum, more or less inwardly curved or rolled at the sides.”

SPECIMEN SEEN.—MARQUESAS ISLANDS: Uahuka Is-

land, *Jones 1712* (BISH) known only from this holotype specimen.

The other collection cited by Brown, *Quayle 1243* from Nukuhiva, and matched by a number of subsequent collections also from Nukuhiva is of quite a different plant, also with 5 stamens. It is here described as *Cyrtandra thibaultii*.

***Cyrtandra thibaultii* Fosberg and Sachet,  
new species**

FIGURE 6

*Cyrtandra jonesii* sensu Gillett, Univ. Calif. Pub. Bot., 66:55–57, 1973, pro maxima parte [non *Cyrtandroidea jonesii* F. Brown, pro maxima parte et specimine typico.]

Frutex arborescens ad 5 m altus dense fulvo-sericeus, foliis  $20 \times 10$ –11 cm, petiolatis, cymis parum supra-axillaribus florentibus inter foliis, 10–18 cm longis, ubi fructificantibus ad 30 cm, calycibus in alabastris ad 2.5 cm post anthesim accrescentibus basim circumscissilibus caducis, corolla vix zygomorpha 5-lobata 40 mm longa, 2 lobis angustioribus, antheris 5, ad apicem rotundatis, ovario lineari-ovoideo biloculario, placentis axialibus, fructibus fusiformibus 4 cm longis. Type: Marquesas Islands, Nukuhiva, *Thibault 134* (US, holotype, isotype).

Tall shrub to 5 m, young twigs squarish,



FIGURE 6.—*Cyrtandra thibaultii* Fosberg & Sachet, dissected flower (*Thibault 134*, type collection)  $\times 1\frac{1}{2}$ . (Drawn by Dulcie A. Powell.)



densely brownish sericeous; leaves elliptic to oblong-elliptic, up to  $24 \times 10$ –11 cm, apex abruptly short-acuminate, base obtuse to acutish, blade subglabrous above except on lower part of midrib and main veins which are densely sericeous becoming glabrous, under surface densely subappressed villous, brownish, petioles of medium thickness to rather slender, 2.5–5 cm long, appressed villous; cymes slightly supra-axillary, budding and flowering ones in leafy portion, mature fruiting ones probably below the leaves (but not available on material we have seen), in flower 14–18 cm long, including flowers, in fruit elongating at least to 30 cm (immature fruit), peduncle 8–9 cm long, ending in a pedicellate flower, two branches ascending from terminal node, a pair of lanceolate leaflike bracts at each node, the lowest petiolate, 2 cm long, each node producing a terminal pedicellate flower and two lateral flowers or branches, with a strong tendency for one branch to develop, the other and the terminal flower to abort, resulting in a forked inflorescence with each branch several internodes long, the nodes bearing pairs of bracts, the terminal one bearing bracts and 1 or usually 3 pedicellate flowers, pedicels 1–1.5 cm, elongating to 2.5–2.8 in fruit; calyx in bud fusiform, to at least 2.5 cm long, appressed villous, 5-costate, costae running into the coherent lobes the tips of which are glandular, lobes tending to separate before the tips, tube sharply prismatic, angles running to sinuses between lobes, lobes triangular, about 5–9 mm long, weak costae running to apices, inner surface notably pilose in upper third, very slightly so below, whole calyx circumscissile at base and caducous after anthesis, said to be accrescent to 4 cm; corolla white, only slightly zygomorphic, 5-lobed, tube about 2.5 cm long, glabrous without except for slight pilosity in lines for a little distance below sinuses, sparsely pilose within in upper  $\frac{2}{3}$ , limb with 5 lobes about 15–20 mm long, oblong, 2 of them narrower, 5 mm wide, 3 others 7 mm wide, oblong, acutish to obtuse, spreading, finely and abundantly glandular puberulent within, also in throat, limb caducous before tube; anthers 5, oblong or ob-

long-sagittate, apex broadly rounded, sessile, equal or unequal, in some flowers 1 smaller called a staminode by Gillett, anthers 2.4–2.8 mm long, inserted in top of tube below sinuses; pistil about 23–26 mm long, ovary linear-ovoid, 12 mm long, glabrous, placentation axile (per Brown and Gillett), ovules many; style 10 mm long, appressed to spreading pilosulous, stigma lobes ovate, 1.5 mm long, pilosulous without, papillate fleshy within; an annular nectary about 1 mm high surrounding base of ovary; immature fruit fusiform, about  $4 \times 0.5$  cm, surface minutely verruculose, style caducous, fruit thickening somewhat at maturity, fleshy; seeds (per Brown and Gillett) broadly elliptic or ovoid in outline, 0.3–0.4 mm long, polygonal reticulate.

**SPECIMENS SEEN.**—MARQUESAS ISLANDS: Nukuhiva Island: Tovii, 854–900 m, *J.-C. Thibault 134* (US, holotype, isotype); 840 m, *Quayle 1243* (BISH); Tovii Valley, *Gillett 2156* (US, UC, HLA, BISH, NY); forêt de montagne à l'ouest de Tovii, *F. Hallé 2064* (US); Toovii Plateau, spur of Mt. Ooumu, 790 m, *Gagné 1048* (US, BISH); between Taiohae Bay and Hooumi Bay, above 700 m, *Gagné 1150* (US, BISH).

This species and the closely related *C. jonesii* are very unusual in their regular or almost regular corollas, five fully developed stamens, and axile rather than parietal placentation. They differ in the size and pubescence of leaves, position of inflorescences, shape of bracts, length of pedicels, shape of calyces, two narrower corolla lobes of *C. thibaultii*, length and shape of anthers, and other more minor characters.

Whether or not the above characters that the two have in common, especially the axile placentation, provide sufficient ground for maintaining the genus *Cyrtandroidea* Brown is a question. Gillett (1973:55) says that *Cyrtandra rarotongensis* Cheeseman, of the Cook Islands, also has axile placentae, and he quotes Burt as saying that several other species of *Cyrtandra* do. His description of *C. rarotongensis* does not suggest a very close relationship with the two Marquesan species. It seems best, until more information is available about placentation of the genus as a whole, to retain *Cyrtandroidea* in *Cyrtandra*, following Gillett.

Incidentally, examination of plate 3, figure f, accompanying the original description of *Cyrtandra*, shows that the Forsters must have had a species with axile placentation, as the drawing clearly shows two cells with bilobed axile placentae. Unfortunately, the Forsters did not indicate which of their two species, *C. biflora* and *C. cymosa*, was used in drawing the fruit; however, St. John (1966:3–5) showed that the Forsters' illustration portrays *Cyrtandra biflora*, of Tahiti, which St. John there designates as lectotype species of the genus.

***Cyrtandra ootensis* F. Brown**

*Cyrtandra ootensis* F. Brown, Bishop Mus. Bull., 130:273, 1935.

This species is not uniform, varying in density of pubescence, density of toothing on leaf margins, length of petiole, in the length and looseness of the inflorescence, and in the width of the corolla. These variations do not correlate very well, but at least four easily perceptible varieties can be sorted out, two of them on Hivaoa, one on Fatuiva and one on Uahuka.

***Cyrtandra ootensis* F. Brown var. *ootensis***

Leaves almost glabrous above, except midrib pubescent when young, sparsely pilose beneath except densely subappressed pilose on veins beneath; cymes densely appressed long-pilose, corolla slender, dilated from 3 mm wide below when pressed to 5 mm near summit, sparsely tomentulose on outer surface, young fruit sparsely hirtellous.

The type of this species (*F. Brown 961*) has leaves that are much less pubescent and very obscurely serrate in comparison with the other available material. The petioles are also more slender than in most of the other material. Two other specimens cited below seem to belong with it.

**SPECIMENS SEEN.**—MARQUESAS ISLANDS: Hivaoa Island: Ootua, 800 m, *F. Brown 961* (BISH, holotype); 900 m, *Gagné 1213* (BISH); "chemin d'Atuona à Hanamenu par Feani" above Atuona, 935 m, *Schäfer 5213* (US); N side of Mt. Temetiu, mountain side, 1100 m, common at high

elevations, 23 Mar 1929, *PES (M & A) 141* (BISH, UC, LeB), Atuona, mountain side, 1100 m, 6 Oct 1930, *PES Ex 141* (BISH).

***Cyrtandra ootensis* var.**

A sterile specimen from Mt. Feani is from a creeping woody stem, rooting at nodes, has leaves much like var. *ootensis* but practically glabrous. The plant is slightly pilose at the growing tips. It may be a juvenile form, or an extreme shade form.

**SPECIMEN SEEN.**—Hivaoa, Mt. Feani, trail from Atuona to Hanamenu, 1120 m, *Oliver & Schäfer 3237* (US).

***Cyrtandra ootensis* var. *fatuhivensis* Fosberg & Sacht, new variety**

Folia late lanceolata vel elliptica, utrinque adpresso-pilosa, serrata; cyma dense recto-pilosa subglandulosa, corollae tubus cylindricus extus dense pilosus; fructus juvenalis pilosus. Type: Marquesas Islands, Fatuiva, *Gagné 1244* (US, holotype; BISH, isotypes).

Small tree to 5 m, trunk to 10 cm diameter, leaves broadly lanceolate to elliptic to 20 × 8 cm, notably pilose on both sides, margins serrate; cyme up to 15 cm, very loose, few-flowered, peduncle 9 cm, pedicels to 5 cm, the whole pilose, the hairs erect, slightly glandular; corolla cylindrical, scarcely tapering, 1 cm wide when pressed, densely pilose.

This may prove to merit specific rank when more specimens are available.

**SPECIMENS SEEN.**—MARQUESAS ISLANDS: Fatuiva Island: Teavapuhiau Pass (above Ouia Valley), 720 m, *Gagné 1244* (US, holotype, BISH, isotypes); 700 m, *Gagné 1245* (BISH) [seems to be the same, but is more sparsely pilose and the corolla is almost glabrous].

***Cyrtandra ootensis* F. Brown var. *mollissima* Fosberg & Sacht, new variety**

Folia subtus dense pilosa mollissima ferruginea. Type: *Schäfer 5923* (US, holotype; BISH, P, MPU, isotypes).

Leaves more ovate and densely appressed pilose



above than in var. *ootensis*, densely soft ferrugineous velutinous beneath, petioles tending to be shorter and stouter, cymes densely appressed velutinous pilose, corolla slender, sparsely tomentulose without; young fruit scarcely pilosulous.

This variety may be readily recognized by the notably soft-velutinous under surfaces of the leaves. Whether or not there is a habitat difference is not clear from the data.

**SPECIMENS SEEN.**—MARQUESAS ISLANDS: Hiva-oa Island: Montagnes NW du Temetiu, entre la haute vallée de Hanamenu et la crête de Temetiu-Feani, 960 m, *Schäfer 5923* (US, holotype; BISH, MPU, P, isotypes); Mt. Ootua, 750 m, *Oliver & Schäfer 3223* (US, BISH, P); 650 m, *Gagné 1176* (BISH); road from Atuona to Puamau, just below Mt. Ootua, 640–690 m, *Sachet et al 2127* (US, BISH, P).

***Cyrtandra ootensis* var. *quaylei*  
Fosberg & Sachet, new variety**

Planta velutina vel lanato-pilosa, foliis late-oblongis vel ovalibus, marginibus argute serrato-dentatis, cymis 9.5–10.5 cm longis dense-pilosis, corollis 2.6 cm longis 0.7 cm latis extus sparse-lanatis, fructu late-ovoido 2 × 1 cm glabrato.

Young parts, under side of leaves, and cymes densely velutinous to woolly-pilose, upper surface of leaves less densely so, blades very broadly oblong or oval, up to 17 × 13 cm, apex acutish or very slightly acuminate, base obtuse, somewhat decurrent on petiole, margin sharply serrate dentate, petioles 3–7 cm long, rather thick, woolly-pilose, flowering cyme 9.5 cm long, fruiting 10–10.5 cm, densely pilose; calyx 15 mm long, divided almost to base, corolla 2.6 cm long, 7 mm wide when dry, thinly woolly outside, fruit broadly ovoid, 2 × 1 cm, glabrate.

**SPECIMENS SEEN.**—MARQUESAS ISLANDS: Without locality, *Henry 7* (P). Uahuka Island, 600 m, est., *Quayle 1755* (BISH, holotype); *Quayle 1790* (BISH).

This variety seems closest to var. *fatuhivensis*, but with shorter cymes, longer flowers, less pilose young fruits, and broader more woolly leaves. It also resembles var. *mollissima* in its dense pubescence.

***Cyrtandra tahuatensis* Fosberg & Sachet,  
new species**

Frutex totus dense fusco-pilosus. Type: Marquesas Islands, Tahuata, *Thibault 83* (US, holotype, isotype).

Shrub to 3 m tall, younger internodes densely velutinous, internodes 0.5–2 cm long, rather quadrangular; leaves pilose above, hairs with pustulate bases, densely pilose beneath and on petioles, blades broadly elliptic, up to 20 cm long, 9 cm wide, apex shortly acuminate, base attenuate, margins glandular serrate, primary veins 10–12 on a side, subopposite, arching upward to margin, petioles 4–5 cm long, fairly thick; cymes on long stiff peduncles, 7–8.5 cm long, densely pilose, with 2 broadly lanceolate bracts at summit enclosing 3 pedicels, the center one developing first, all three finally reaching about 2 cm long; calyx to 2 cm long, divided almost to base into 5 subequal ovate-lanceolate acuminate densely pilose lobes, these deciduous as fruit begins to develop; corolla 25 mm long, tube cylindric, 18–20 mm long, 8 mm wide when dried, lobes suborbicular; ovary and style densely pilose; immature fruit narrowly ovoid, acuminate, densely pilose; mature fruit not known.

This species, known only from the type collection, is obviously very close to *Cyrtandra ootensis* F. Brown, especially its variety *fatuhivensis*, but differs in its dense ferrugineous-pilose indumentum on all parts, and in its stiff strongly ascending to spreading triflorous bracteate cymes, and its shorter corollas. It might be regarded as a variety of *C. ootensis*, but is strikingly distinct in appearance and instantly recognizable. It was noted in an annotation by Schäfer as “*Cyrtandra* sp. (nov.?)”

**SPECIMEN SEEN.**—Tahuata Island, above Hamatea, on the central crest of U’ua’o, 850 m, *Thibault 83* (US, holotype, isotype).

***Cyrtandra revoluta* Fosberg & Sachet,  
new species**

Frutex crassicaulis carnosus, foliis congestis coriaceis valde revolutis infra villosis, petiolis bre-

vibus villosissimis; cymis brevibus axillaribus; calyce parte quinquefido; fructu parvo globoso subglabro. Type: Marquesas Islands, Fatuiva, *Montgomery (Gagné)* 1276 (BISH, holotype, US, isotype).

Shrub with thick fleshy stems and very short internodes, densely fuscous-woolly; leaves very crowded, stiff-coriaceous, elliptic, up to  $10 \times 5$  cm, margins strongly revolute, apices obtuse, bases acute to obtuse, upper surface thinly long pilose, glabrate, pustulate from persistent bases of hairs, under surface strongly fuscous villous, petioles short, 5–10 mm long, 4–5 mm wide, very densely fuscous villous; cymes short, up to 2–2.5 cm, crowded between the leaves, bracts elliptic, about 10–15 mm long, lobed half or two-thirds to base, sparsely pilose; corolla white (according to collector, not seen on specimen); fruit almost glabrous, subglobose, about 5 mm long, with persistent style about 2–3 mm, cyme in fruit below leaves, recurved, arching downward.

This is a most remarkable species, possibly related to the probably extinct *Cyrtandra tovana* F. Brown.

**SPECIMENS SEEN.**—MARQUESAS ISLANDS: Fatuiva, base of Mt. Natahu, on cliff face, 828 m, *S. L. Montgomery (B. H. Gagné's)* 1276 (BISH, holotype, US, isotype).

### *Cyrtandra feaniana* F. Brown

*Cyrtandra feaniana* F. Brown, Bishop Mus. Bull., 130:272–273, fig. 38, 1935.—Gillett, Univ. Calif. Publ. Bot., 66:55, 1973.

This is the commonest and most widely distributed of the Marquesan *Cyrtandra* species, found on Nukuhiva, Uahuka, and Hivaoa, with most of the collections from the latter island. It is easily identified as it is the only completely glabrous species in the Marquesas.

What seems to be the same species, but with a slightly different aspect, leaves broader than usual, and a trace of pubescence on the very young growth, occurs on Tahuata. It may be left in this species until more material and information are available.

**SPECIMENS SEEN.**—MARQUESAS ISLANDS: Tahuata Is-

land, au-dessus de Hamatea sur la crête centrale de U'ua'o, 850 m, *Thibault* 79 (US), 82 (US).

### *Cyrtandra tovana* F. Brown

*Cyrtandra tovana* F. Brown, Bishop Mus. Bull., 130:271–272, fig. 37, 1935.—Gillett, Univ. Calif. Publ. Bot., 66:52, fig. 8, 1973.

This species is endemic to Nukuhiva, and has not been found by recent collectors. It is regarded by Gillett as having unisexual flowers, of which complete pistillate ones are not available.

### *Cyrtandra nukuhivensis* F. Brown

*Cyrtandra nukuhivensis* F. Brown, Bishop Mus. Bull., 130:274–276, fig. 40, 1935.—Gillett, Univ. Calif. Publ. Bot., 66:52, 1973.

This has been found on Nukuhiva and Uapou; it was recollected by the Gagnés and Montgomery, on Nukuhiva. It seems well distributed there in the wet areas. A specimen from between Taiohae Bay and Hooumi Bay, 900 m, *W. C. Gagné* and *Montgomery (B. H. Gagné's)* 1160 (BISH) has unusually small leaves, calyx cleft unusually deeply, and corolla 2.5 cm long, shorter than described by Brown and Gillett.

### *Cyrtandra* sp.

Since the above was written we have examined two sheets kindly lent by the authorities of the Paris Herbarium, determined by Gillett in 1974 as *Cyrtandra nukuhivensis* F. Brown, but which do not seem to belong to that species. They are from the Marquesas, Hivaoa, "Ravin humide, près les hauts plateaux de Hiva-Oa, route de Hanamenu," *Henry* in 1919 (P, 2 sheets). They have an apparently unbranched stem, soft, fistulose, 1 cm thick, thinly woolly-pilose when young, especially at nodes, glabrate, up to at least 8 cm long, flattened when dried; leaves very broadly ovate to oval,  $15\text{--}18 \times 10\text{--}12$  cm, rounded or subtruncate to very slightly decurrent at base, obtuse to rounded and shortly mucronate at apex, margin bluntly and almost imperceptibly subdentate,



main veins 10 on a side, with 1–2 (or more) small, short subsidiary ones between each 2 main ones, distally becoming a coarse network, blades when young but almost full sized having upper surface arachnoid, densely so on veins, soon becoming practically glabrous, lower surface densely woolly when young, becoming glabrous, petioles thick, woolly, becoming glabrous, 5–6 cm long; with very young inflorescences sessile or almost so, enclosed in bracts about 2 cm long.

This doubtless represents an undescribed species, but since the specimens are so nearly sterile it seems best not to name it until flowering or fruiting specimens can be obtained.

## 17. Nomenclature of *Dichrocephala integrifolia* (L. f.) O. Kuntze (Asteraceae)

### *Dichrocephala* L'Héritier

*Dichrocephala* L'Héritier in de Candolle, in Guillemin, Arch. de Botanique, 2:517–518, 1833; in de Candolle, Prodr., 5: 372, 1836.

This is a small genus of Asteraceae, commonly placed in the tribe Astereae, with a few African and Asiatic species, one of which extends into the Pacific to Polynesia. The name of the widespread species has been the subject of some disagreement. This we discuss below, with records of its occurrence in Polynesia.

There has been an unusual amount of nomenclatural confusion concerning the small weedy, apparently medicinal, plant most commonly but incorrectly called *Dichrocephala latifolia* (Lamarck) de Candolle. This species, according to ING is the type (lectotype) of the genus *Dichrocephala* L'Héritier, though the parenthetical author is there given erroneously as Persoon, when it should be Desfontaines.

Although there now seems to be no doubt that the correct name of this common widespread Indo-Pacific species is *Dichrocephala integrifolia* (L. f.) O. Kuntze, it seems worthwhile to give in some detail the history of the case so that users of this name will not have to go to the trouble that we have experienced in verifying its correctness.

The following annotated synonymy is arranged chronologically by first dates of publication of the principal early names involved.

### *Dichrocephala integrifolia* (L.f.) O. Kuntze

*Cotula bicolor* Parkinson, Jour. Voy. Endeavour, 43, 1773 [nomen nudum].

*Ethulia paniculata* Houttuyn, Nat. Hist., II, 14:551, t. 67, f.2, 1779.—Merrill, Jour. Arn. Arb., 19, 371, 1938. [Non *Dichrocephala paniculata* Miquel, Fl. Ind. Bat. 2:38, 1856]. [Miquel's name is sometimes thought to be a transfer of the Houttuyn species, but it was not accompanied by any mention of an earlier publication, nor did Miquel cite Houttuyn's type. Hence, any transfer of *E. paniculata* to *Dichrocephala* would create an illegitimate later homonym.]

*Hippia integrifolia* L.f., Suppl. Pl., 389, 1781.—Aiton, Hort. Kew., 3:278, 1789. [Specimen 1039.1 in Herb. LINN, London, which can be considered the type of *Hippia integrifolia*, is, so far as can be determined from a good microfiche photo, the plant ordinarily called *Dichrocephala latifolia*. The leaves are broadly ovate, coarsely serrate, have up to 8 teeth on a side, with 3 nerves from the base and one more pair just above the base, so it could be called 5-nerved. The inflorescence and heads are correct, racemose-paniculate, discoid. Thus the application of *H. integrifolia* seems reasonably certain. *H. integrifolia* therefore apparently provides the earliest available epithet for transfer of this plant to *Dichrocephala*.]

*Cotula bicolor* Solander ex Forster f., Prodr. 91, 1786 [nomen nudum].

*Grangea* [*latifolia*] Lamarck, Tabl. Encycl., 3:pl. 699, 1796. [This is undoubtedly the plant under discussion, but the plate bears only the name *Grangea*, with no specific epithet. This was supplied in the text, which did not appear until 1823. Therefore the plate cannot serve to validate the binomial, *G. latifolia*.]

*Cotula bicolor* Roth, Catalecta Pl., 2:116, 1800.—Persoon, Syn. Pl., 2:464, 1800 (in syn.). [Roth's publication of his binomial is valid and the epithet is available. Merrill (1954:350) states that Roth, when he published this binomial in 1800, knew nothing of the two earlier, invalid uses of the same binomial, but gave no reasons for his belief. In any event, Roth made no reference to any earlier use, so his epithet originated with his 1800 publication.]

*Grangea latifolia* Desfontaines, Tableau de l'Ecole Bot., 95, 1804.—Lamarck in Poiret, Encycl. Méth. Suppl., 2:826, 1812; Tabl. Encycl., 3:276, 1823. [After much search, we conclude that Desfontaines is the earliest author to publish the epithet *latifolia* for this plant, though it is usually ascribed to Lamarck. Persoon, in his treatment of *Cotula*

*latifolia* (1806, see below) referred to "grangea latifolia Desf. l.c.," which refers back to "Desf. Cat. H.P. 95." This turns out to be a reference to Desfontaines, *Tableau de l'Ecole Bot.*, 95, 1804. Desfontaines published the name *Grangea latifolia* with four words of description—"à feuell. larges ☉"—enough to effect valid publication. The sign ☉ was used in older works to indicate that the plant is an annual. Though it is antedated by *Ethulia paniculata* Houttuyn (1779), *Hippia integrifolia* L. f. (1781), and *Cotula bicolor* Roth (1800), it is not illegitimate, as would have been either Persoon's or Lamarck's (Poiret's) uses if they had been earliest, as they both cited *Cotula bicolor* Roth in synonymy, which would have made them superfluous. The parenthetical author for any transfer of this epithet should, however, be Desfontaines, rather than Lamarck or Persoon, both of which have been used. This, of course, is academic, as the earliest available epithet is supplied by *Hippia integrifolia* L. f. (1781).]

*Cotula latifolia* (Desfontaines) Persoon, *Syn. Pl.*, 2:464, 1806.  
*Hippia bicolor* (Roth) J. E. Smith in Rees, *Cyclop.*, 18:[48], 1819 [1811].

*Centipeda latifolia* (Desfontaines) Cassini, *Dict. Sci. Nat.* ed. 2, 50:211, 1827.

*Dichrocephala latifolia* (Desfontaines) de Candolle in Guillemin, *Arch. Bot.*, 2:518, 1833; in Wight, *Contr. Bot. Ind.*, 11, 1834; *Prodr.*, 5:372, 1836.—Seemann, *Fl. Vitiensis*, 144, 1866.—Nadeaud, *Enum. Pl. Tahiti*, 48, 1873.—Drake, *Ill. Fl. Mar. Pac.*, 203, 1890; *Fl. Poly. Fr.*, 104, 1892.—Yuncker, *Bishop Mus. Bull.*, 220, 1959. [This is the name that has usually been used for the plant under consideration since 1836. Before 1836 it had been, under several specific epithets, referred to several genera, as listed above. Under the "Kew Rule" this would have been correct. Under all post-1905 codes of botanical nomenclature the oldest available specific epithet must be used. De Candolle, in his *Prodromus* treatment (1836) listed a number of binomials, mostly herbarium and manuscript names, in the synonymy of *D. latifolia*. Since most of these were not validly published we are not listing them here. They are referred to by *Index Kewensis* as first published "ex DC. *Prodr.* V. 372." Exceptions are *Cotula bicolor* Roth (and its derivative *Hippia bicolor* Smith, see above), and *Spilanthus atriplicifolius* L., which is a validly published species now referred to another genus, *Lipocarpa*. *Cotula sinapifolia* Roxburgh may refer to the plant of that name in Roxburgh's *Hortus Bengalensis* (1814:62), but that is very dubiously published, indeed, besides being later than several other available names listed above.]

*Dichrocephala bicolor* (Roth) Schlechtendal, *Linnaea*, 25:209, 1852.—Exell, *Cat. Pl. S. Tomé*, 223, 1944.—Hara, *Enum. Spermat. Jap.*, 2:192, 1952.—Backer and Bakhuizen, *Fl. Java*, 2:381, 1965.—Ohwi, *Fl. Jap. ed. 2*, 877, 1965.—

Walker, *Fl. Okinawa*, 1020, 1976. [Several recent authors have used this name, unaware of the earlier available epithet, *integrifolia*.]

*Dichrocephala integrifolia* (L.f.) O. Kuntze, *Rev. Gen. Pl.*, 333, 1891.—Weibel, *Candollea* 16:183, 1958.—Hara, *Fl. E. Himalaya*, 338, 1966.—Kitamura, *Acta Phytotax. Geobot.*, 23:129, 1969.—Ramamoorthy in Saldanha and Nicolson, *Fl. Hassan Distr.*, 611, 1976. [Weibel was the first modern author to use *D. integrifolia*, merely giving the Kuntze name and its basionym, with no comment. He has been followed by a few of the more critical workers on Asiatic plants. This name seems to be the correct one under the present *International Code of Botanical Nomenclature* (Stafleu et al. 1978).]

**DESCRIPTION.**—Depressed to usually erect herb to 35(–50) cm, rooting at lower nodes when depressed, more or less hirsute or hirsutulous especially in younger parts; leaves alternate, sparsely appressed hirsutulous, usually somewhat lyrate lobed at base, petiolate or uppermost sessile and somewhat clasping, terminal lobe (or entire blade if not lobed) broadly ovate, prominently and regularly or irregularly serrate, dentate, or even sublacerate, obtuse to acutish at apex; inflorescence loosely paniculate usually (1–)2–3 times branched, small foliaceous bracts at ramifications, these strongly reduced above, or even absent at ultimate ramifications, 1–2 reduced bractlets on peduncles; heads appearing discoid, hemispherical to globose, 3–4 mm across, involucre of 1(–2) series of few oblong to ovate phyllaries with green midrib and central area, and broad thin glandular-fimbriate hyaline margins, inner phyllaries when present, somewhat shorter; receptacle depressed-globose, glabrous, speckled with wart-like white scars; marginal flowers pistillate, in 6–8 series, appearing spirally arranged, corollas whitish or yellowish to slightly purplish, tubular, about 0.5 mm long, becoming bent, appearing sub-fleshy, apex 3-toothed, style branches tardily somewhat exerted, disk flowers bisexual, fleshy, greenish to purplish, glandular, funnelform or somewhat campanulate, apex deeply 4-lobed, lobes thick, broadly ovate, obtuse or acutish, style-branches included; achenes obovate, 1.2–1.5 mm long, glabrous, margins



rounded, apex truncatish, sticky, sides smooth to lightly striate; pappus none or of 2 minute setae.

This plant is found from Africa to the Society Islands and, apparently, Hawaii, though it has not been seen there since David Nelson collected it on Captain James Cook's voyage in 1779. Sydney Parkinson, artist to Joseph Banks, on Captain James Cook's first voyage around the world, in 1769, made an excellent drawing of this species, now in volume 1, no. 48, of the unpublished collection of Parkinson drawings in the British Museum (Natural History). This demonstrates, beyond any doubt, that this species was in Tahiti in the pre-European period. Seemann's record of it from the Marquesas, citing a Barclay specimen, repeated by Drake, seems, with little doubt, to be based on a misidentification of Barclay's specimens of *Adenostemma*. No Barclay specimen of *Dicrocephala* was found in the British Museum by J. B. Marshall in his study of the Barclay collection (unpublished). It is reputed to have medicinal properties and is said to have been cultivated in several islands. Its Polynesian distribution is as follows, so far as known.

**GEOGRAPHICAL RECORDS AND SPECIMENS SEEN.**—SOCIETY ISLANDS: Banks and Solander, fide Seemann (1866), Drake (1892). Tahiti: s.l., fide Nadeaud (1873), "taata-hiara"; Lépine 42, Nadeaud 334, Savatier, fide Drake (1892), "tatavera"; *Banks and Solander* (US); *Wilder* 331 (BISH), "tata taahira." Raiatea, N of Avera, cultivated, *J. W. Moore* 336 (BISH), "taata hiara." Borabora, Tevaitapui Tepare, 650 ft [210 m], *Grant* 4903 (BISH). AUSTRAL ISLANDS: Rimatara I., Anopoto, 2 m, *Fosberg* 12060 (BISH). HAWAIIAN ISLANDS: s.l., Nelson, fide Seemann (1866). SAMOA: s.l., *U.S. Exploring Exped.* (US). TONGA ISLANDS: s.l., Cook, fide Seemann (1866). FIJI ISLANDS: Seemann 264, fide Seemann (1866).

## 18. Miscellaneous Taxonomic and Distributional Notes

A number of new island records and taxonomic clarifications seem worth placing on record.

### *Charpentiera australis* Sohmer

*Charpentiera australis* Sohmer, *Brittonia*, 24:290–292, fig. 2, 1972.

A plant collected by Dr. W. R. Sykes, in the Cook Islands, seems identical with material of *Charpentiera australis*, a woody Amaranthaceae from the Austral Islands, except for slightly narrower, more acuminate leaves, to  $23 \times 9$  cm, and narrower, slightly more acuminate floral bracts. This specimen is immature, but when more mature material is available it should be compared very closely with the type. This is a notable but logical range extension of a genus otherwise known only from the Austral and Hawaiian Islands. Our thanks are due to Dr. Sykes for sharing this collection with us.

**SPECIMEN SEEN.**—COOK ISLANDS: Rarotonga, Takuvaine Valley, on slope facing  $\pm$  W, c. 700 ft [215 m], 31 Jul 1975, *W. R. Sykes* 2025/CI (US).

### *Lobularia maritima* (L.) Desvaux

*Lobularia maritima* (L.) Desvaux, *Jour. de Bot. Appl. Agr. Pharm. Med.*, 3:162, 1814.

*Clypeola maritima* L., *Sp. Pl.* 652, 1753.

*Alyssum maritimum* (L.) Lamarck, *Encycl. Méth.*, 1:98, 1783.

The common garden sweet alyssum was cultivated in Pitcairn and Tubuai in 1934. It tends to become naturalized on bare soil but does not persist very long in competition with other plants in favorable habitats.

**SPECIMENS SEEN.**—PITCAIRN ISLAND: Adamstown, cult., 60 m, *Fosberg & B. Christian* 11196 (BISH). AUSTRAL ISLANDS: Tubuai, Mataura, 3 m, *St. John & Fosberg* 16247 (BISH).

### *Rubus rosaefolius* J. E. Smith

*Rubus rosaefolius* J. E. Smith, *Pl. Ic. Ined.*, 3: t. 60, 1791.

A specimen collected in Rapa in 1934 was determined by L. H. Bailey as *Rubus illecebrosus* Focke, and distributed under this name. Reexamination of several sheets of this collection suggests that it is really a form of *Rubus rosaefolius* with five rather than seven leaflets. This species is otherwise known in Polynesia only from Hawaii.

**SPECIMEN SEEN.**—AUSTRAL ISLANDS: Rapa Island, Area, 50 m, *Fosberg* 11380 (K, BISH).

### *Vigna luteola* (Jacquin) Bentham

*Vigna luteola* (Jacquin) Bentham in Martius, Fl. Bras., 15(1): 194, pl. 50, 1859.

*Dolichos luteolus* Jacquin, Hort. Vindob., 1:399, pl. 90, 1770.

*Dolichos repens* L., Syst. ed. 10, 1163, 1759.

*Vigna repens* (L.) Kuntze, Rev. Gen. Pl., 1:212, 1891 [non Baker 1876].

The specimen reported here is true *V. luteola*, with elliptic-acuminate leaflets and slender pods. There have been previous records of this species from Polynesia, but they have generally been regarded as misidentifications of *V. marina* (Burman) Merrill, the common Pacific strand species.

This seems to be the first authentic record of this species from the Pacific Islands east of the Ryukyus. Its distinction from *V. marina* seems to be slight, except for leaf shape and perhaps smaller pods.

In the Dominican Republic, West Indies, some specimens determined *Vigna luteola* (or as *V. repens*) have leaves much like those of *V. marina*.

SPECIMEN SEEN.—SAMOA: Upolu, cleared coral-sand area at Mulinu'u Peninsula W of Apia, 9 Aug 1972, Whistler W277 (US).

### *Melicoccus* P. Browne

*Melicoccus* P. Browne, Civ. Nat. Hist. Jamaica, 210, 1756.

*Melicocca* L., Sp. Pl. ed. 2, 495, 1762.

One species of this genus, native of Tropical America, is planted in the Society Islands and Marquesas.

### *Melicoccus bijugatus* Jacquin

*Melicoccus bijugatus* Jacquin, Enum. Syst. Pl. Carib., 19, 1760.

*Melicocca bijuga* L., Sp. Pl. ed. 2, 495, 1762.

This plant is commonly known as *Melicocca bijuga*, but both the generic and specific names are antedated by the names given above as shown by Brizicky (1963:473). Jacquin did not provide a generic description except for the sign  $\bar{h}$  meaning woody, but he referred to Browne's ample generic description which is of a monotypic genus, thus validating his binomial beyond any doubt.

In the Marquesas the fruit is eaten with avidity by children. It is commonly eaten in the West Indies.

SPECIMENS SEEN.—SOCIETY ISLANDS: Tahiti, *Wilder* in 1932 (NY). MARQUESAS ISLANDS: Hivaoa: Atuona, village street, 5 m, *Sachet* 1249 (US), "quenette"; in gardens, 10–20 m, *Sachet* 1934 (US), 1941 (US), 1949 (US). Fatuhiva, Omoa, Grelet estate, 10 m, *Decker* 2747 (US), "Quenettier."

### *Triumfetta rhomboidea* Jacquin

*Triumfetta rhomboidea* Jacquin, Enum. Syst. Pl. Carib., 22, 1760.

*Triumfetta bartramia* sensu auct. plur. [non L., Syst. ed. 10, 1044, 1759].

This is the plant more often called *Triumfetta bartramia* L. However, in the original publication of *T. bartramia* in the *Systema Naturae*, tenth edition, Linnaeus cited *Bartramia indica* L. (1753) in synonymy, making *T. bartramia* L. a superfluous name, illegitimate, and automatically typified by *Bartramia indica* L., hence not even a synonym of *T. rhomboidea* Jacquin, a pantropical undershrub, now reported for the first time from the Gambier Islands, Makatea, and Rapa.

SPECIMENS SEEN.—GAMBIER ISLANDS: Mangareva, Tairavai, 10 May 1922, *Quayle & Curtis* 481 (BKL). MAKATEA ISLAND: 200 ft [60 m], *Wilder* 1132 (BISH). AUSTRAL ISLANDS: Rapa, Mangaoa Peak, 320 m, *St. John & Maireau* 15377 (BISH) [leaves very small].

### *Miconia calvenscens* de Candolle

*Miconia calvenscens* de Candolle, Prodr. 3:185, 1820.—Wurdack, Bailey, 18:17, 1971.

*Miconia magnifica* (Hort.) Triana, Trans. Linn. Soc. Bot., 28: 131, 1871.

This South American tree is said to have been introduced into Tahiti in 1937, according to advice from the Service de l'Economie Rurale: Section des Eaux et Forêts. By 1974 it had spread to an alarming extent. Today it has supplanted all other vegetation on certain slopes on the south side of the island, is spreading everywhere in the moist valleys, and is proving to be serious competition for the native vegetation.

It is a small to medium sized tree, with large



ovate to broadly elliptic, strongly trinerved leaves and large panicles of small white flowers. These produce clusters of blue-black fleshy berries about the size of peas. Thus it is perfectly adapted to be spread by frugivorous birds.

This is the first record of it, and of the genus *Miconia*, from the Pacific islands. It is naturalized and spreading in Jamaica and Ceylon in moist areas. Its native range is from Mexico through Central and South America to Brazil. It appears to be a major threat to the already endangered flora of Tahiti.

This information was kindly passed on to us by Dr. John Wurdack, who in 1971 established the synonymy given above. The plant is known to the authorities in Tahiti as *Miconia magnifica*.

### ***Cordia lutea* Lamarck**

*Cordia lutea* Lamarck, Tabl. Encycl., 1:421, 1972.

In 1966, we discussed the occurrence of this American species in the Marquesas. It was then thought that this was its western limit. However, a specimen collected in Tonga by the *U.S. Exploring Expedition* (US), determined as *C. rotundifolia* Ruiz & Pavon, is undoubtedly a small-leaved, unusually densely short-hispid form of *C. lutea* Lamarck.

It has apparently not been found in western Polynesia since that time. The possibility cannot, of course, be excluded that this specimen was mislabelled.

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